ABSTRACT

EDUCATIONAL LEADERSHIP

JOHNSON, ARICA RENEE B.A. CLARK COLLEGE, 1979

M.A. CLARK ATLANTA UNIVERSITY, 1997

A STUDY OF TEACHERS' PERCEPTIONS OF EFFECTIVE SUPERVISORY BEHAVIORS: THE IMPACT THESE PERECEPTIONS HAVE ON MATHEMATICS PERFORMANCE, PROGRAM PERFORMANCE AND STUDENT BEHAVIOR

Advisor: Dr. Ganga Persaud

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The purpose of this study was to examine mathematics teachers' perceptions of supervisory leadership style, principal leadership style, assessed student needs, instructional support, and staff development practices by mathematics consultants, principals and other instructional observers and the impact these behaviors have on student behavior, program performance and mathematics performance. This study focused on teachers' perceptions in low, medium and high performing urban middle schools in a southern urban school district. There was a comprehensive reform model in mathematics. Therefore the purpose was also to determine effective supervisory behaviors to provide suggestions for improvement based on results. Data for the investigation were collected via a Mathematics Supervisory Questionnaire (MSB), Observation Based Instruction Assessment (OBIA) classroom

observation instrument and telephone interviews, developed by Ganga Persaud in collaboration with the researcher. The data analysis was accomplished using the Statistical Program for Social Sciences (SPSS) package. A random sample of thirty-three participants were selected from four low, medium ad high performing middle schools in a southern urban school district. Three of the sample population schools had a mathematics comprehensive school reform model (CSRM) and one did not. Findings specific to the research questions are briefly presented as follows: (a) there was a significant relationship between principal leadership style and program performance and student behavior; (b) there was a significant relationship between instructional support and program performance; and (c) there was a significant relationship between staff development and mathematics performance and student behavior. The conclusions drawn from the findings suggest that teachers' perceptions of principal, instructional observers and mathematics supervisors are primarily based on personal need, expectations, and past experiences. Moreover, this research informed educators at all levels understandings of the impact of using teachers as a viable resource for insights to improving mathematics and program performance and student behavior.

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CHAPTER I

PROBLEM IN CONTEXT

Purpose

The purpose of this study was to examine mathematics teachers' perceptions of supervisory leadership style, principal leadership style, assessed student needs, instructional support, and staff development practices by mathematics consultants, principals, and other instructional observers and the impact these behaviors have on student behavior, program performance, and mathematics performance. This study focused on teachers' perceptions in low, medium and high performing urban middle schools in a southern urban school district. There was a comprehensive reform model in mathematics. Therefore the purpose was also to determine effective supervisory behaviors to provide suggestions for improvement based on results.

Student Performance in Mathematics as a Problem

Dependent/Outcome Variable Problems

Locally, student achievement in the area of mathematics in a southern urban school district's four middle schools have shown no consistency of incremental gain over the last four years (i.e.,1999-2000, 2000-2001, 2002-2003, and 2003-2004), as evident by the Georgia Criterion Competency Test (GCRCT).

According to southern urban school district's deputy superintendent for instruction, middle school scores are also rising, though not as fast, and the passing rate

in math remains around 50%. The deputy superintendent for instruction was pleased with the progress. But she acknowledged that a lot of work remains to be done to make sure that the gains seen in the younger grades are carried over to middle and high school.

At the state level, the Georgia Department of Education (GDOE) releases a list of schools across the state of Georgia that do not meet Adequate Yearly Progress (AYP). AYP is one of the cornerstones of the federal No Child Left Behind (NCLB) Act and its accountability criteria and an annual measure of student participation and achievement on statewide assessments and other academic indicators. It requires schools to meet standards in three areas. According to the GDOE, the school will be considered in "Needs Improvement Year 4" and will be subject to all of the consequences outlined. The school will also be identified for restructuring and must develop (but not yet implement) an "alternate governance" or restructuring plan. The plan may include converting the school into a charter school, replacing all/most of the staff, turning it over to a private management company, or any other major restructuring of the school's governance arrangement that makes fundamental reforms. Presently, two of the middle schools have not met AYP in mathematics for five consecutive years, prompting the state to put in place a rigorous restructuring plan of action to be implemented by all stakeholders. Like the rest of the nation, Georgia is struggling with how to teach its middle school students.

Nationally, the results from the National Assessment of Educational Progress (NAEP), the Nation's Report Card revealed the average eighth grade student can not compute the amount of change to be given when buying a product (Braswell, Lutkus, Grigg, Santapau, Tay-Lim, & Johnson, 2000).

Internationally, the Third International Mathematics and Science Study (TIMSS) involving 26 nations including the United States, American fourth graders placed twelfth in mathematics, and a respectable third in science (Calsyn, Gonzales, & Frase, 1999). When TIMSS was readministered four years later to eighth graders in 38 countries, American students had lost ground, slipping to nineteenth in mathematics and eighteenth in science (Gonzales, Calsyn, Jocelyn, Mac, Kastberg, Arafeh, Williams, & Tsen, 2001). Based on all the indications listed she/he will be behind in mathematics for six years.

Table 1 clearly shows GCRCT mathematics student achievement percentile scores for the southern urban school district for middle grades 6th and 8th grade levels over the last four years. The decrease in mathematics student achievement scores varies drastically with limited pockets of success rarely occurring consistently year after year with percentile scores over 70% in four middle schools in the Table 1. Table 1 shows the southern urban school district schools' mathematics student achievement data for grade levels 6th and 8th not scoring over the 70th percentile on the Georgia Criterion Competency Test (GCRCT).

Strategies Tried to Make a Difference

The mathematics comprehensive school reform model (CSRM) in place in the four middle schools is a renowned mathematics CSRM. One specific mathematics CSRM is in three of the middle schools, while one middle school has a different mathematics CSRM. Even though the mathematics CSRM's have been in place for over three years in the middle schools, there has been no significant closure of the mathematics achievement gap, as evidenced by GCRCT scores in Table 1. Albeit, mathematics is an academic target

Table 1

GCRCT Mathematics Student Achievement Percentile Scores

5 year Span	1999-2000		2000-2001		2001-2002		2002-2003		2003-2004	
Middle School	6th	8th	6th	8th	6th	8th	6th	8th	6th	8th
A	62	--	61	--	52	54	42	50	54	53
B	48	36	71	49	62	50	50	58	53	67
C	28	12	25	22	33	30	32	25	39	34
D	35	31	33	35	35	38	43	43	54	64

and indeed a goal of systemic reform for all schools in the urban school district, the mathematics CSRM's are demonstrating some growth, but not significantly enough for students to show consistent mathematics gain at this present time.

Some of the 24 schools supervised by the area superintendent have a CSRM with an identified consultant/facilitator whose job primarily is to enhance teacher instruction while simultaneously boosting student achievement in reference to scripted academic program components. Sometimes the instructional support focus on behalf of the central office personnel is perceived by school level staff as the role of evaluator which rules out building a trusting relationship with teachers of mathematics.

The school based mathematics reform model consultants and the district wide team leader are puzzled by the quarterly mathematics assessment results. Presently, the mathematics program reform models in three of the schools are being realigned to the

Georgia Performance Standards, in an effort to remedy students' mastery of Quality Core Curriculum/Georgia Performance Standards. The results from last years scores lead the team leader for the mathematics comprehensive reform to proactively construct and survey mathematics teachers to determine their satisfaction with the mathematics CSRM in an attempt to explain low test scores. The results of the survey were not positive.

In addition, some comprehensive reform consultants/facilitators do not possess the content and data desegregation skills, and/or credentials to support teachers in the classroom with research based instructional practices and mathematics content, therefore only adding to the mathematics student achievement problem. According to Fischer (2004):

> To enhance the professional effectiveness of the teaching staff administration, all must be skilled in these areas: (a) what to evaluate, (b) how to observe and analyze classroom observation information and other data, and (c) how to translate the results of observations and the summary of the data into meaningful conference feedback that guides and encourages teachers to improve instruction. (p. 30)

Independent Variables in Context

The area superintendent of schools, oversees that daily instructional planning, personnel, and physical plant in every K-8 school assigned. In addition, the area superintendent's support staff servicing the schools are composed of are eight content specific instructional facilitators who provide schools with ongoing coordination of

instructional support based on the executive director vision for schools, which is reflective of the superintendent's vision for student performance in a southern urban school district.

At the school level, middle school principals are responsible for managing the school's resources (i.e. human, physical and monetary). The middle school principals of the four schools understudy are that the public has access to data reflective of their schools. The stakeholders are not satisfied with the school's mathematical progress as it relates to GCRCT test scores. Therefore, each school had to revised there school achievement plan to reflect the how they were going to provide support to teachers. It was observed that not one plan incorporated effective supervisory behavior processes or practices or research based strategies relating to instructional leaders equipping themselves with effective supervisory behaviors.

Teachers as well as other instructional support staff shared how school level instructional leaders (i.e. principals, assistant principals, instructional liaison, and grade level chair) are not providing them with (1) time to collaborate with one another; (2) modeled instructional support, and (3) immediate instructional feedback to improve classroom performance.

Figure 1 shows the independent variables in context which produced causes that need solutions in order for mathematics student achievement in the urban school district to show significant gain.

Sources/Causes of the Problem

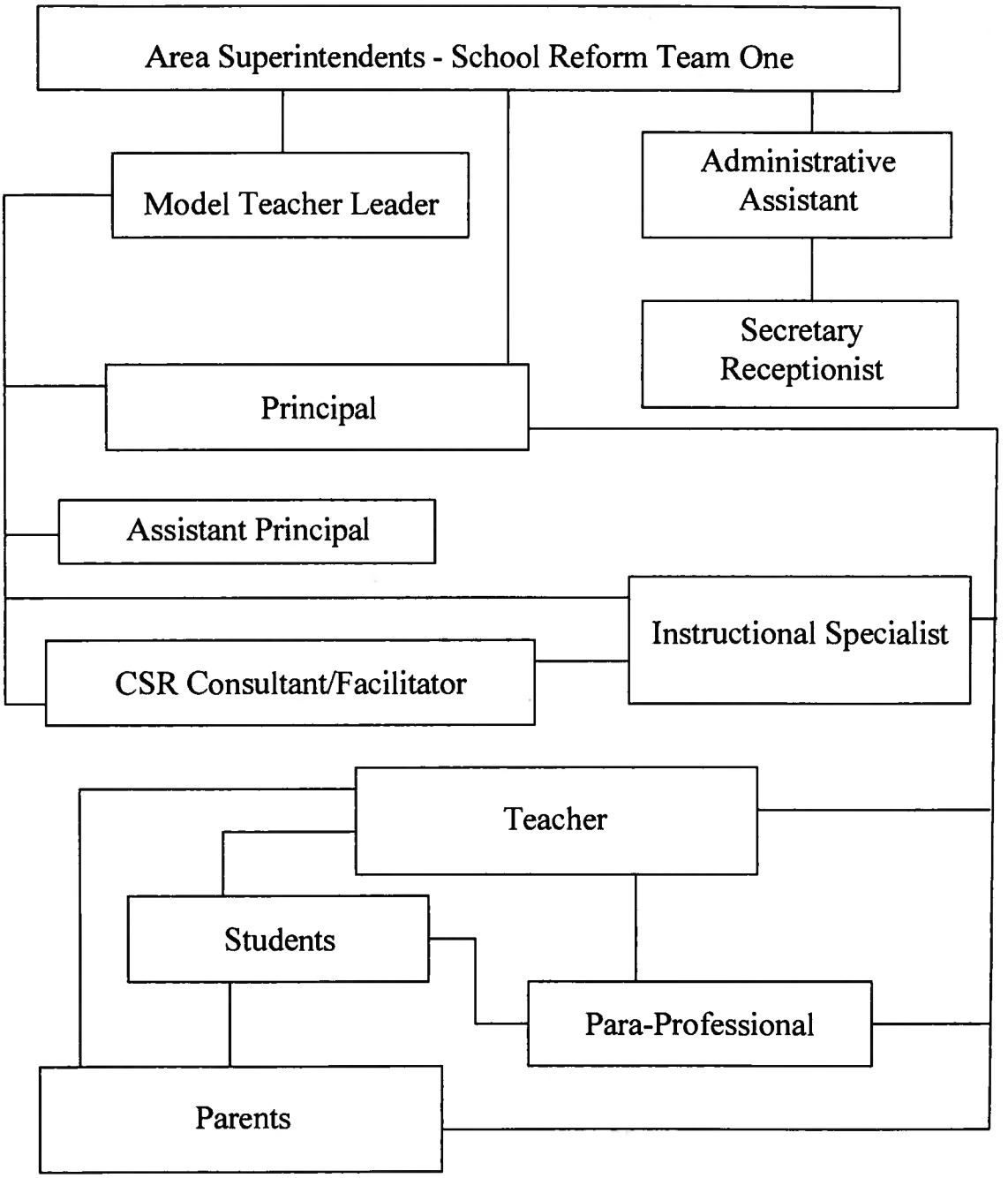

Figure 1. Southern Urban School District Organizational Chart

Statement of the Problem

It is proposed that to determine the relationship between student behavior, program performance and mathematics performance on the mathematics GCRCT sixth through eight grade level and effectiveness of supervisory behaviors such as leadership style, principle leadership style, assessed student needs, instructional support, and staff development, a close look at teacher perceptions is needed. Several researchers have examined teacher perceptions (Ladson-Billings, 1994; Irvine, 1984; Griffin-Jeansone, 1984; Caliste, 1984).

Significance of the Study

This study was designed to empirically examine the relationship between supervisory behaviors on student behaviors, student performance, and mathematics program performance based on the perceptions of mathematics teachers. There is a need for educational researchers to focus more on mathematics teachers' perceptions for answers about the impact of supervisory behaviors on student achievement. This study was significant because it provided new research that will produce effective processes and strategic practices to be shared with instructional leaders in primary and secondary schools across the nation.

At present we know some about the significance between supervisory behaviors and its impact on student achievement. This study provided supervisory behavior guidelines for instructional leaders and created an avenue for teachers to receive constructive and ongoing feedback in order to improve student achievement in the classroom. Teachers must be allowed to take ownership for their professional development

through collaborative, transformational decision making modes with highly qualified instructional leaders who speak common language about instruction and model the appropriate supervisory behavior to make a significant impact on student achievement.

For urban central office staff, school level CSRM consultants and team leaders, school level principals, assistant principals, instructional liaison specialists, grade level chairs, teachers, and researchers this study provided:

1. A prescriptive supervisory behavior model (SBM) with the aim of:
    - Sharing effective supervisory behavior approaches
    - Instructional support for teachers of mathematics
    - Productive teacher feedback
    - Building a collegial atmosphere
    - Transforming ineffective mathematics classroom instruction
    - Influencing teacher motivation
    - Providing effective professional development for instructional leaders to correct any negative perceptions teachers have about the impact of supervision in urban school districts
2. Data about specific effective supervisory behavior approaches to influence the way instructional leaders interacted with teachers to improve mathematics student achievement.

CHAPTER II

REVIEW OF RESEARCH LITERATURE

The following studies reflect empirical research findings within the last five years, albeit there was an intermix of classic studies-old research because of its significant content.

Supervisory Behaviors and Models

Goldhammer, Anderson, and Krajewski (1980) suggest the novice is in practice with face-to-face observations. The cycle continues with observations, analysis and strategy and post observation conference. Data continues to be drawn first hand from face to face observations of the novice in actual practice. The shift moves from that of the preceptor to that of a colleague and consultant, therefore promoting more involvement from the novice. In the first stage, there is a preconference which focuses on clarifying objectives, strategies, and evaluation procedures. Secondly, the observation gathers data using objective instrument and there is a concentrated focus. Thirdly, the analysis and strategy, aids in analyzing data to identify strengths and weaknesses and the identification of future focus. Last but not least, the post observation conference provides feedback to the novice and decisions are made about future practices.

Goldhammer (1969), while attending a Harvard education program in the late 1950s, coined the first codification models which received attention nationally. Later, Goldhammer revised the work of Morris Cogan and published "Clinical Supervision"

methodology (Goldhammer, Anderson, & Krajewski, 1980). The authors developed and examined a five step supervisory cycle: (1) preobservation conference, (2) observation of teaching, (3) analysis and strategy development, (4) supervision conference, and (5) postconference analysis. The authors debated that principals who want to be considered instructional leaders need to spend half of their day engaged in activities related to curriculum, supervision, and teacher support. Goldhammer and others agreed that the only way to improve classroom performance was through a prescriptive cycle that could be second guessed by the teacher and the supervisor.

Glickman (1981) and Wolfgang and Glickman (1980) have examined the potential impact of supervisory behaviors (i.e. directive control, directive informational, collaborative, and nondirective) on student achievement, findings that one can assess how supervisors typically behave with staff based on a supervisory behavior continuum. The categories of supervisory behavior were collected through observing individual actions in meetings with groups of teachers for the purpose of making classroom or school decision. Glickman states:

> these categories encompass almost all observed supervisors behaviors that are deemed purposeful. A *purposeful* behavior is defined as one that contributes to the decision being made at the conference or meeting. The derived categories of supervisory behaviors are listening, clarifying, encouraging, reflecting, presenting, problem solving, negotiating, directing, standardizing, and reinforcing. (p. 125)

The author further stated that the success of a school depends on supervision, because it is the function that draws all the elements of instructional effectiveness into whole school action. In order to foster student achievement in the classroom, there must be in place an effective supervision model outlining specific supervisory behaviors.

Acheson and Gall (1980) report a number of studies in which the clinical supervision model has been accepted by teachers when they and their supervisors are taught systematic observation techniques. They further note that this process is viewed as productive by teachers when the supervisor uses "indirect" behaviors (e.g. accepting feeling and ideas, giving praise and encouragement, asking questions).

Morris Cogan (cited in Acheson & Gall, 1977) defined clinical supervision as a model for conducting observations of a teacher as "the rationale and practice designed to improve teacher's classroom performance" (p. 9). Cogan is known as the father of clinical supervision. He believes data should be collected from teachers in the classroom, and that both the teacher and supervisor would collaborate to plan programs, procedures and strategies focused on moving teachers' classroom behavior and instruction to a higher level for student success.

Ingersoll (2001) found that teachers who move from school to school and district to district is a phenomenon called migration, and that it accounts for half the turnover that schools and districts experience. Successful implementation of models of supervision and effective supervisory behavior by instructional leaders and the applicability of research findings provide momentum to school organizations who are investigating ways to improve student achievement in mathematics and other goals of the system.

According to Gordon (1997), "A paradigm shift toward the collegial supervision model, if it is to succeed, must include a shift away from conventional or congenial supervision toward collegial supervision" (p 116). In addition, his view of supervision includes all of the following:

1. A collegial rather than a hierarchical relationship between teachers and formally designated supervisors.
2. Supervision as the province of teachers as well as formally designated Supervisors.
3. A focus on teacher growth rather than teachers compliance.
4. Facilitation of teachers' collaboration with each other in instructional improvement effort.
5. Teacher involvement in ongoing reflective inquiry. (p. 116)

In a related study, Jo Blasé (cited in Gordon, 1995), captures the spirit of this new, collegial approach to supervision in the following description:

> Leadership is shared with teachers, and it is cast in coaching, reflection, collegial investigation, study teams, exploration into the uncertain, and problem solving. It is positioned free supervision wherein the underlying spirit is one of expansion, not traditional supervision. Alternatives, not directives or criticism, are the focus, and community of learners perform professional—indeed, moral—service to students. (p. 116)

According to Qwens (2004):

> Supervisors are often perceived as being in hierarchical authority over teachers, not infrequently, supervisors feel that they are being maneuvered, against the spirit of the role, into exercise of authority over teachers, which threatens their more appropriate collegial relationship with them. These perceptions by supervisors cause dysfunctional ways (i.e. ambiguity and tension) of coping with the situation, because the instructional leaders' role contains contradictory elements or is vague. (p. 127)

Principal Leadership Style

Anthoy Bryk (2000) found three common elements among the principals of productive schools: (1) leadership style, (2) leadership strategies to spark improvement, and (3) the issues on which principals focus. These principals' leadership style had an inclusive, facilitative orientation that assisted principals in their efforts to focus the school on student learning and teaching. The principals used strategies that included targeting highly visible problem and solving it quickly ("quick hits"), maintaining a long term focus on the instructional core, creating a strategic orientation through a comprehensive, coherent plan for school development, and attacking incoherence.

Scheerens and Bosker (cited in Hill, 2002) identified five dimensions of instructional leadership:

- Time devoted to educational versus administrative tasks.
- The head teacher as a meta controller of classroom processes.
- The head teacher as a quality controller of classroom teachers.
- The head teacher as a facilitator of work oriented teams.

- The head teacher as an initiator and facilitator of staff professionalization. (p. 53)

Johnson and Birkeland (2003), studied the career path of 50 teachers in Massachusetts for four years and found that one group of new teachers categorized as *"Voluntary Movers,"* expected their new schools to provide basic resources, functioning infrastructures, mentors they could collaborate with and a respectable principal who was involved in the life of the school. When the Voluntary Movers felt their new school wanting, they left the new school and set off to a different one. By year three, the Voluntary Movers did not give up on teaching like the other teachers in the study, instead they looked for schools where they could feel like a professional (i.e. sharing of ideas and resources with colleagues, receiving respect, and guidance from the principal). One Voluntary Mover by the name of Mary in the study wanted lots of supervision and instructional guidance from her first new principal, but did not seek his help, because she knew his schedule was exhausted and overwhelmed. So on the next teacher interview; Mary wanted a good match, so she met with the principal, two vice principals and department head who would be her immediate supervisor.

It is evident that supervision is important to teachers' satisfaction with their school selection process and/or placement, whether it be collegial or clinical. Teachers must feel that the school is structured and provides lots of supervision. The findings from this study suggested that to stop teacher turnover and attrition, school leaders should provide teachers with the full range of supports.

Fullan (1991) discovered in his research that "schools operated by principals who were perceived by their teachers to be strong instructional leaders exhibited significantly greater gain scores in achievement in mathematics than did schools operated by average weak instructional leaders" (p. 156).

Assessed Student Needs

According to Hilliard (1997):

> We need to pay greater attention to the history of individual teachers in raising academic achievement so we can work with teachers who are not particularly productive. We can't do that, though, unless we have a record of who's doing what with students. That means disaggregating information about student learning by teacher so we know who needs assistance. (p. 1)

In addition, schools need to help teachers learn how to use student assessment results to modify and target their own classroom instruction (Holloway, 2003). The author further states:

> These researchers agree that the evidence of student learning, as collected in both formative and summative assessments, can be a powerful tool to guide professional development and teacher collaboration. Using performance data allows educators to focus their valuable and limited professional development resources o the specific learning needs of students. Professional development centered on student achievement goals is meaningful to teachers, enabling them to base their instructional decisions

on solid evidence of what students need. More important , such professional development supports the goal of ensuring the success of all students. (p. 86)

Schmoker (2002) found that schools and districts succeed no matter what socioeconomic challenges are present. The author concludes that professional development should be in alignment with what affects student learning by having teachers work in collaborative teams with primary focus on assessed standards, reviewing achievement data to target learning gaps; and regularly design and assess instructional strategies to target the specific standards that students are not meeting, according to the assessment data. Furthermore, professional development is aligned to the trajectory of ensuring student success.

Assessment is a concept that is defined in the *Assessment Standards* as "the process of gathering evidence about a student's knowledge of, ability to use, and disposition toward mathematics and of making inferences from that evidence for a variety of purposes" (National Council of Teacher of Mathematics [NCTM], 1995, p. 3).

In April of 2000, the National Council of Teachers of Mathematics (NCTM) released *Principles and Standards for School Mathematics.* This document was an update of its original standards document published in 1989. For this purpose of the study, the writer will elaborate on *The Assessment Principle* covered in the document. The Assessment Principle reflects "*Assessment should support the learning of important mathematics and furnish useful information to both teachers and students* (NCTM, 2000, p. 22).

Assessment should be a major factor in making instructional decisions. By continuously gathering information about student growth and understanding, teachers can better make the daily decisions that support student learning. For assessment to be effective, teachers must use a variety of assessment techniques, understand their mathematical goals deeply, and have a good idea of how their students may be thinking about the mathematics that is being developed (Walle, 2004).

In NCTM in 1995 published six *Assessment Standards for School Mathematics.*

1. *The Mathematics Standard*
    - Assessment should reflect the mathematics that all students need to know and be able to do. (p. 11)
2. *The Learning Standard*
    - Assessment should enhance mathematics learning. (p. 13)
3. *The Equity Standard*
    - Assessment should promote equity. (p. 15)
4. *The Openness Standard*
    - Assessment should be an open process. (p. 17)
5. *The Inferences Standard*
    - Assessment should promote valid inferences about mathematics learning (p. 19)
6. *The Coherence Standard*
    - Assessment should be a coherent process. (p. 21)

Tomlinson (1999) stated that when we create effective communities of learners in which the needs of all learners are specifically and systemically addressed, we will go a long way toward addressing both equity and excellence in schools.

According to the California Department of Education (1999), differentiating instruction accomplishes one basis goal and that is for every student to meet or exceed reading expectations. Differentiating of instruction accomplishes this goal by tailoring instruction to students' current level of knowledge and skill. A differentiated classroom responds to the needs of all learners. Advanced students, as well as those with learning difficulties, often require systemically planned differentiation to ensure that curriculum and instruction are properly challenging.

Differentiated instruction is determined largely by assessment, and may be provided in small groups or, for those needing the most help, in individual tutoring sessions. Pacing is perhaps the most commonly used strategy for differentiation: teachers either slow down or speed up instruction. It can be a simple, effective and inexperience strategy for many students with special needs (Benbow & Stanley, 1996; Geary, 1994).

Instructional Support

According to Guskey (2003), NCLB has mandated that schools plan backward and think in terms of what student outcome or learning goals to be obtained.

Black and Williams (1998) share the primary strategy for raising standards is the classroom environment. The author expresses their thoughts about policymakers who establish standards and accountability systems, because they fail to recognize the importance of the teacher's actions or the need for teacher support in order to raise student

achievement. "It seems strange, even unfair, to leave the most difficult piece of the standards raising puzzle entirely to teachers" (p.140). The conclusion is that training teachers in how to use formative assessments results to align instruction to student individual needs.

Lieberman (1995) found that teachers need opportunities to talk publicly about their work ad to participate in decisions about instructional practices.

Ladson-Billings (1994) identified several principles that guide cultural relevant classrooms:

- Teacher-student relationships are fluid and humanely equitable
- Cultivation of relationships beyond the classroom boundaries
- Involve practices that demonstrate correctness with each of their students
- Characterized by practices that encourage a community of learners
- Educators should view knowledge critically and be passionate about knowledge
- Help students develop necessary skills
- Ensure that student diversity and individual differences are always taken into account

Pajak and Glickman (1989) studied school districts with consistent student achievement gains for four years. They found three major dimensions about the how of school improvement present in all school districts:

1. An instructional dialogue: Teachers were engaged in a continuous cycle of discussing, planning, implementing, and reviewing curriculum and instruction.

2. An infrastructure of support: Each superintendent had set up an organizational structure and designed staff responsible for fostering dialogue about improving instruction and student learning.
3. Varied sources of instructional leadership: Although principals supported instructional efforts, they usually were secondary instructional leaders. The primary instructional leaders varied from system to system. They included central office supervisors, assistant principals for instruction, department chairs, grade level leaders, and teams of teachers.

Staff Development

Holloway (2003) in his article *Linking Professional Development to Student Learning states:*

> With No child Left behind adding momentum to state accountability efforts, some researchers suggest that the focus of professional development needs to change. Schools need to use student assessment results systemically to identify professional development needs and to design professional development opportunities accordingly. (p. 40)

Mizel (2003) believes that for schools to move students to a higher level, professional development must be thought of as a sequential process that begins with engaging educators in learning experiences and culminates with specific advantages to the learner. The author also found that both teachers and school leaders see a value in professional development when it is linked to student achievement.

In a study of professional development for teachers (Persad, Lewis, & Farris, 2001) the National Center for Education Statistics found that teacher's participation in professional development activities were driven by integrating education technology into the grade or subject taught 74% of the time, 72% spent on studying in depth the subject areas of the main teaching assignment, and implementing new methods 74% of the time.

According to the Interstate School Leaders Licensure Consortium's Proposition for Quality Professional Development of School Leaders (Council of Chief State School Officers, 2000), quality professional development:

- Validates teaching and learning as the central activities of the school;
- Engages all school leaders in well planed, integrated, career long learning to improve student achievement;
- Promotes collaboration to achieve organizational goals while meeting individual needs;
- Models effective learning processes; and
- Incorporates measures of accountability that direct attention to valued learning outcomes.

Professional development that is effective in changing teaching practices and student learning outcomes in schools not only requires a considerable investment in time and money. It also requires that the professional development is sustained and ongoing (Darling-Hammond, 1999; Fullan, 1994) and occurs within the context of the teacher's school day and his or her work with students.

According to Dufour and Berkley (1995), professional development for school principals should communicate to teachers the importance of principals' continuous learning and clearly demonstrate that enhancing one's abilities is so vital that principals are willing to allocate time to increase their own knowledge and skills.

Joyce ad Showers (1983) found that training is a powerful process for enhancing knowledge ad skills. It is plain from the research on training, they say, "that teachers can be wonderful learners. They can master just about any kind of teaching strategy or implement almost any technique as long as adequate training is provided" (p. 2).

The National Staff Development Council, describes some of the new demands on school leaders. The focus is on improving the skill level of principals on the job, because some do not know what it takes to be an instructional leader (NCES Principals, 1977).

Little (1982) examined work environments in three elementary and three urban desegregated schools. The aggregated data revealed that over three years, four relatively successful and two relatively unsuccessful schools were studies. Little found that professional development and school improvement in the successful schools were fostered by shared expectations of collegiality and continuous improvement. She further concluded that four types of interactions are crucial to achieving norms of collegiality and continuous improvement:

1. Teachers engage in frequent, continuous, and increasingly concrete and precise talk about teaching practice.
2. Teachers are frequently observed and provided with useful (if potentially frightening) critiques of their teaching.

3. Teachers plan, design, research, evaluates, and prepares teaching materials together.
4. Teachers teach each other the practice of teaching. (p. 331)

According to Bloom and Stein (2004), small learning communities that focus on supporting teacher development through the supervision process can have a transformational effect on student achievements. Bloom and Stein comment that through these collaborations, they have designed a very simple model for leadership professional development around supporting classroom instruction.

Goldhammer (1969) shared that the aim of the observation, "is to capture the realities of the lesson objectively enough and comprehensively enough to enable the consulting teacher and teacher to reconstruct the lesson as validly as possible afterwards, in order to analyze it" (p. 83).

Mathematics Performance

Dispelling the Myth Revisited (Jerald, 2001) found that majority of about 4,500 poverty stricken schools' children are scoring at high percentage rates (i.e. upper 30 percent). This research adds proof to the fact that poor and/or minority children in poverty communities can learn and show high academic performance.

The report listed seven characteristics that were critical to the schools success. The characteristics highlighted state standards for designing curriculum and instruction, more instructional time for reading and mathematics, student assessed best practices professional development, student monitoring systems, parental involved in students learning,

accountability systems at the state and district level, and use of assessment to guide decision making about instruction and resource selection.

Glickman (1986) states that staff development and improvement of schools go hand in hand. Lortie (1986) found that when teachers perceive that they can participate in important school level decisions, the relationship between the extra efforts required by school improvement and the benefit of these efforts required by school improvement and the benefits of these efforts becomes clearer.

Ladson-Billings (1994) shares in her book *"Dream Keepers"* observances of teachers in her study on cultural relevant teaching:

1. When students are treated as competent they are likely to demonstrate competence.
2. When teachers provide instructional "scaffolding," students can move from what they know to what they need to know.
3. The focus of the classroom must be instructional.
4. Real education is about extending students' thinking and abilities.
5. Effective teaching involves in-depth knowledge of both the students and the subject matter. (pp. 123-125)

CHAPTER III

THEORETICAL FRAMEWORK

Mathematics performance, program performance and student behavior can be influenced by supervisory behaviors such as supervisor leadership style, principal leadership style, assessed student needs, instructional support, principal leadership style and staff development (Figure 2).

Assumptions

When teachers of mathematics receive quality supervisory support they are better able to teach and relate to students not meeting academic standards and students meeting and exceeding academic standards which will simultaneously influence mathematics performance and program performance, as evidenced by the GCRCT. Then those students achieve and the mathematics cycle is adhered to with fidelity, therefore influencing program performance. In addition, when weak students obtain success in the classroom, there is a likelihood they will improve their behavior.

Definition of Variables

Independent Variables are defined to indicate the influence on the dependent variables.

Mathematics Supervisor Leadership Style: A clusters of actions such as: conducting the communication process in a two-way manner, valuing opinions if differ,

TEACHERS' PERCEPTION ABOUT SUPERVISORY BEHAVIORS

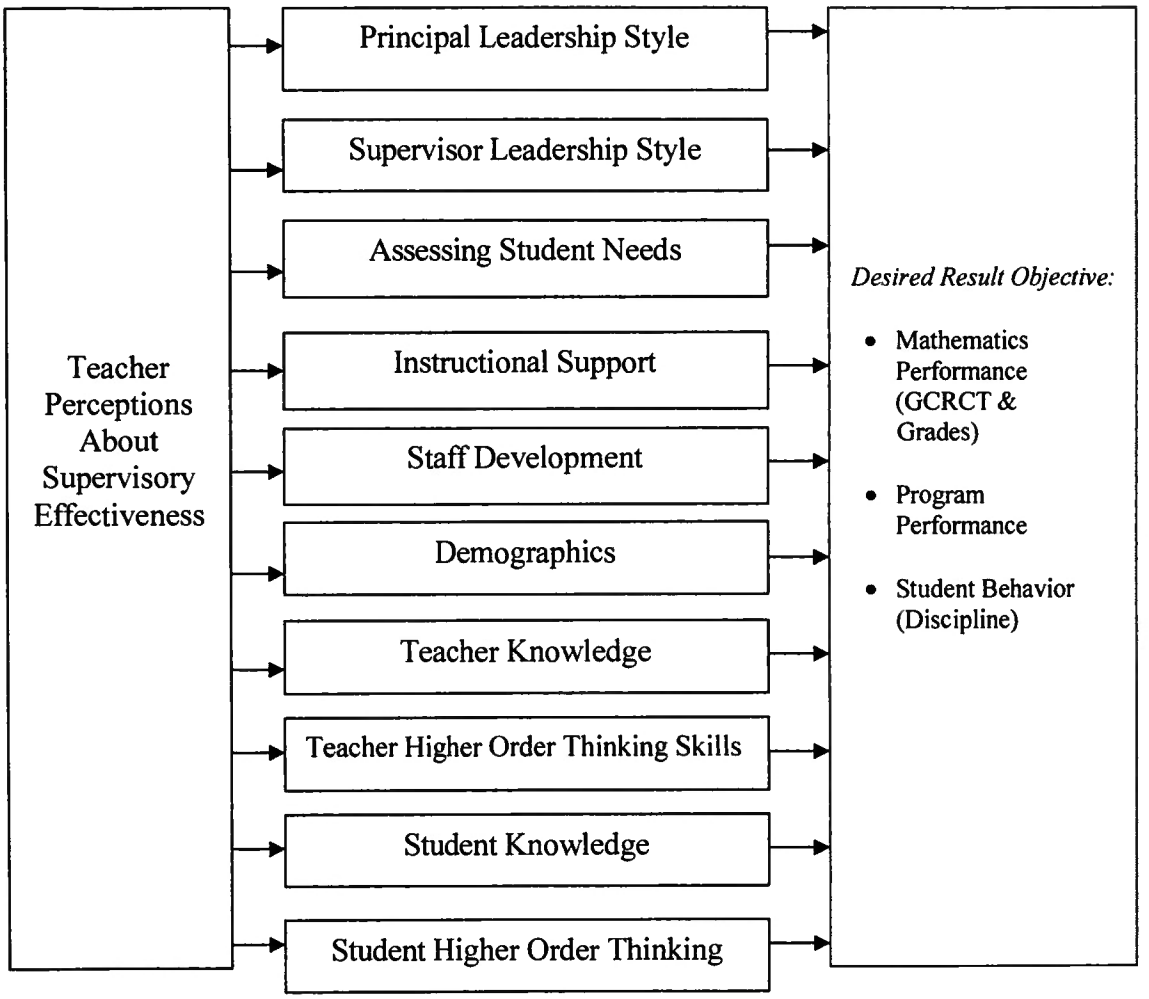

Figure 2. Theoretical Framework Design (Johnson, 2005)

asking for opinions about mathematics lessons, and using opinions on how to get each child to learn mathematics during post observation conference. Acts as a mathematics peer coach who gives nonevaluative informal feedback to teachers of mathematics without adverse consequences.

Assessed Student Needs: A method for identifying students weaknesses and strengths based on asking teachers to identify the low achievers (below grade level) in mathematics, identify students with discipline problems, identify the causes for students performing below grade level in mathematics, and asking teachers to identify the causes for students having discipline problems during post observation conferences.

Instructional Support: Teacher support that shows how the mathematics program would counteract the causes for students not achieving during post observation conferences. Modeling how the various stages in the mathematics program teach so that low achievers and/or discipline problem students could improve their higher order thinking skills during post observation conferences. Teacher discussion of strategies that work for low achievers or discipline problems to learn higher order thinking skills during the warm up stage, problem solving, focus lesson, differentiated lessons, reflection ad homework phase during post observation conferences

Principal Leadership Style: A clusters of actions such as: conducting the communication process in a two-way manner, valuing opinions if differ, asking for opinions about mathematics lessons, and using opinions on how to get each child to learn mathematics during post observation conferences. Focused on instruction so that all kids can learn and asking the teacher to identify aspects that were not effective during post

observation conferences. Having teachers to identify the low achievers (below grade level), students with discipline problems, causes for students performing below grade level during post observation conferences. Discussing teaching strategies for counteracting the causes for students having learning problems, that work for low achievers to learn higher order thinking skills and that worked for discipline problem students to become well behaved during instruction during post observation conferences. Conducts informal classroom observation of entire staff, can put teachers on a professional development plan for instructional improvement, and can terminate them.

Staff Development: Training whereby, presenters (i.e. supervisors, principals and other instructional observers) demonstrate how to identify the causes for student's failure in mathematics, incorporate higher order thinking skills into daily instruction for mathematics, how to utilize evaluation data to make changes in mathematics instruction. Training whereby, presenters (i.e. supervisors, principals and other instructional observers) provide materials ad explanations while teachers listen with some question ad answer session at the end, opportunities for teachers to give opinion on what could work in classrooms and what could not. Modeling practically steps for implementing intended mathematics strategies. Explains the steps of the method in mathematics, then organized teachers to role play or practice the strategy for application in their classrooms.

Cost of Mathematics Program: The program's worth when considering the amount of gains made by students who were below grade level. The program's worth as all or early all students below grade level improved one grade level.

Demographics: The background information on various groups of people selected for a research study (i.e. gender, age, educational background, school, number of years teaching, and student achievement, etc.).

Dependent/Outcome Variables: Defined to indicate the influence by the independent variables.

Program Performance: The cost value based on the amount of gains made by students who are below grade level. The cost based on all or nearly all students below grade level improving to grade level; determined based on teachers' recommending the program to other school systems and to other schools within the system.

Mathematics Performance: Gained knowledge about the basic skills as compared to when students started. Demonstrating the use of higher order thinking skills as compared to when students started and interest in mathematics similar to on or above grade level students. The improve achievement level to earn an "A or B" grade. Regarding student performance on the Criterion-Referenced Competency Test (i.e. Level 1, Level 2 and Level 3).

Student Behavior: The degree to which students have improved their behavior when they started the program and well behaved students. Not being referred to the office or counselor for discipline. The improvement of student's self-concept, therefore the student becomes self-generated, creative, and independent learners.

Linkages Among the Variables

The independent variables being manipulated in this study are supervisory leadership style, principal leadership style, assessing student need, instructional support, staff development, and teacher demographics which are related to the dependent variables.

The dependent variables in this study were student behavior, program performance and mathematics performance. The independent variables questions students mastery of the Quality Core Curriculum under the instructional guidance their immediate mathematics supervisor, principal and other instructional observers. The dependent variables measured by the Georgia Criterion Reference Competency Test (GCRCT) Results. The observed differences on the dependent variable will be directly related to the independent variables.

Research Questions

The following research questions guided this study and the analysis of the data: According to teachers:

RQ1: Is there a relationship between principal leadership style and mathematics and program performance and student behavior?

RQ2: Is there a relationship between assessed student needs and mathematics and program performance and student behavior?

RQ3: Is there a relationship between instructional support and mathematics and program performance and student behavior?

RQ4: Is there a relationship between staff development and mathematics and program performance and student behavior?

RQ5: Is there a relationship between teacher demographics such as gender and mathematics and program performance and student behavior?

RQ6: Is there a relationship between student demographics, such as free and reduced lunch and mathematics and program performance and student behavior?

CHAPTER IV

RESEARCH METHODOLOGY

Research Design

The design for this study involved a mixed methodology, which engaged the researcher with studying naturally occurring phenomena in all their complexity. This research design set forth a comprehensive plan of action for collecting data in order to answer the research questions being posed to multiple subjects. A quantitative and qualitative process for collecting data was used.

According to Kvale (1996):

> If you want to know how people understand their world and their life, why not talk with them? In an interview conversation, the researcher listens to what people themselves tell about their lived world, hears them express their views and opinions in their own words, learns about their views on their work situation and family life, their dreams and hopes. The qualitative research interview attempts to understand the world from the subjects' points of view, to unfold the meaning of peoples' experiences, to uncover their lived world prior to scientific explanations. (p. 1)

Since it was the intent of this study to provide a comprehensive understanding of effective supervisory behaviors and its "primary stakeholder" the mathematics supervisor, principal and other instructional observers from the perception of teachers and to uncover any

influences the teachers' perceptions may have on student behavior, program performance and mathematics performance were the quantitative (i.e. Mathematics Supervisory Behavior [MSB] Questionnaire and Classroom Observation Instrument) and qualitative (i.e. telephone interview) were the best methods to collect needed data.

The design controlled for sources of errors by using multiple data collection methods, such as a questionnaire, classroom observation instrument and telephone interview. These measures help to compensate for omissions or distortions that may have arisen from the use of one method. There was no variation in the way that data was collected.

Description of Population and Setting

This study was conducted in 33 sixth through eight middle grade classrooms, totally four middle schools. The four schools' total sample population percentages of the student population receiving free and reduced lunches ranged from 80.0% to 99.9%. The heterogeneous population representing the schools highlighted in this study was a total of 33 middle school teachers of mathematics instructing at low, medium, and high performing schools in a southern urban school district in Georgia with a combine total of 112 years of teaching experience. The most experienced teacher had (more than 20 years) and most inexperienced teacher (2 years).

Descriptive Data

Of the 33 respondents to the MSB Questionnaire, 9 (27.3%) were male and 24 (72.7%) were female. The data are presented in Table 2. Respondents to the questionnaire were asked to indicate the highest degree held. The choices were bachelor, master, master

Table 2

Demographic Characteristics: Gender

Gender	Frequency	Percent
Male	9	27.3
Female	24	72.7
Total	33	100.0

plus, and specialist or greater. The majority of respondents held a four year degree. The data are presented in Table 3.

Table 3

Demographics Characteristics: Highest Degree

Highest Degree	Frequency	Percent
Bachelor	9	66.7
Masters	5	15.2
Master +	2	6.1
Specialist or higher	4	12.1
Total	33	100.0

It can be seen that majority of teachers responding to the instrument had less than six years of teaching experience. As shown in Table 4, 9 (27.3%) respondents reported 1-2 years of teaching experience; an equal number of respondents reported 3-5 years of teaching experience. Eight (24.2%) respondents reported 6-10 years of teaching experience; 4 (12.1%) respondents reported 11-15 years of teaching experience. Only 1 (3.0%) respondent reported 16-20 years of teaching experience; 2 (6.1%) respondents reported more than 20 years of teaching experience.

Table 4

Demographic Characteristics: Teaching Experience

Years of Teaching Experience	Frequency	Percent
1-2 years	9	27.3
3-5 years	9	27.3
6-10 years	8	24.2
11-15 years	4	12.1
16-20 years	1	3.0
21 or more years	2	6.1
Total	33	100.0

The data revealed that the majority of the schools' percentages of students receiving free and reduced price lunch to be 80.0% to 99.9% (See Table 5). An observation about the participating schools portrayed medium sized middle schools with approximately three fourths of their students receiving free or reduced lunch.

Table 5

Percentage of Students on Free and Reduced Lunch

Ranges of Percentages	Frequency	Percent
Under 10%	0	0.0
10.0% - 19.9%	1	3.0
20.0% - 29.9%	0	0.0
30.0% - 39.9%	0	0.0
40.0% - 49.9%	0	0.0
50.9% - 59.9%	1	3.0
60.0% - 69.9%	2	6.1
70.0% - 79.9%	2	6.1
80.0% - 89.9%	8	24.2
90.0% - 99.9%	19	57.6
Total	33	100.0

Response Analysis of the MSB Questionnaire means and standard deviations were calculated for the five (subscales) of the MSB Questionnaire. The highest mean was for the Supervisory Leadership Style subscale at 3.45 *(SD= 1.18).* The lowest mean was for the Instructional Support subscale at 2.35 *(SD= 1.07).*

Instrument Reliability

Cronbach's alpha coefficients were used to determine the internal consistency of the study instrument. Table 6 provides the Cronbach's alpha coefficients calculated from teachers' responses on the MSB Questionnaire, both for the entire instrument and for the individual subscales. Reliability of the MSB Questionnaire was calculated at an alpha of 0.9465 for the instrument, with alpha levels for the individual subscales ranging from 0.7764 to .9145.

Table 6

Cronbach's Alpha Reliability Coefficients for the MSB Questionnaire and for Individual

Subscales Instrument	Number of Respondents	Coefficient Alpha
MSB Questionnaire	33	.9465
Supervisory Leadership Style	33	.8032
Assessing Student Needs	33	.7922
Instructional Support	33	.7764
Staff Development	33	.8082
Principal Leadership Style	33	.9145

Sample

The sample for this research study was 33 and defined as a group of subjects on which information was obtained. The sample population was randomly selected from low, medium, and high performing middle schools in a southern urban school district due to the fact the individuals had special qualifications. The researcher made sure the sample was representative of the larger population by involving four schools labeled low, medium and high. The researcher wanted to find out how teachers perceived their mathematics supervisor, principal and other instructional observers impact on student discipline, program performance and mathematics performance. A sample of 33 was selected from the total faculty of four middle schools. Eight faculty members from each of the three comprehensive reform schools were selected and 7 faculty members from the noncomprehensive school were selected on the basis of the following criteria. They had taught mathematics, they were apart of a professional learning team, and were a middle grade mathematics teacher.

According to Fraenkel and Wallen (2003), a "sample" in a research study refers to any group on which information is obtained. The larger group to which one hopes to apply the results is called the population.

Instrumentation

Highly reliable measures were used to collect data from the sample. The "Mathematics Supervisory Behavior" (MSB) questionnaire, Teacher: Observation Based Instruction Assessment (OBIA) mathematics cycle instrument and the telephone interview were constructed by the researcher in collaboration with Dr. Ganga Persaud, a renown

professor of quantitative and qualitative methods at Clark Atlanta University, especially as it relates to making sure validity and reliability is represented in the data collection procedures. The questionnaire was used as a data collection tool to survey teachers' views of supervisory behaviors. Teachers checked one response (i.e.1=never, 2=a little, 3=sometimes, 4=most times, and 5=always) for sixty items listed based on a 1-5 scale. The directions on the questionnaire explained to teachers that, the researcher was interested in their opinions from a purely research basis, therefore their opinions were provided anonymously. The Statistical Package for the Social Sciences (SPSS) was utilized to conduct three types of analysis of the study data (i.e. descriptive data, Pearson Correlation, and factor analysis). Multiple correlations were calculated to evaluate the relationship between teachers' perceptions of supervisory behaviors and student behavior, program and mathematics performance. The final analysis used the Pearson Correlations to determine relationships between independent variables ad dependent variables.

The classroom observation instrument was constructed by Persaud (1993) and revised by Persaud (2005) in collaboration with the researcher to reflect six categories representing mathematics best practices. The instrument was reflective of the "National Council for Accountability of Teachers in Education" (NCATE) requirements that reflects teacher critical acts in teaching (CAT) mathematics for delivery of knowledge, skills, and disposition. In addition, the classroom observation instrument was aligned with the southern school district's research based best practices for teaching mathematics (i.e. warm up, problem solving; focus lesson; differentiated instruction, standards, higher order

thinking skill (HOTS), disposition, and knowledge, etc.). The telephone interview was constructed by Persaud (2005) in collaboration with the researcher.

Data Collection Procedure

In order to obtain data for determining teachers' perceptual influence of supervisory behaviors on student behavior, program performance and mathematics performance, this study looked at supervisory behaviors of teachers' immediate mathematics supervisors behaviors in low, medium and high performing middle schools. Using low, medium and high performing middle schools produced a more in-depth teacher perspective; thereby, a wealth of quantitative and qualitative data was acquired and used for analysis relating to the influence on the dependent/outcome variables at the four middle schools mentioned earlier.

Three types of data were collected using a questionnaire, classroom observation instrument and telephone interview: quantitative frequency count data and qualitative data via telephone interview written responses. Data accuracy was verified through oral telephone interviews with participants.

Participants were asked to complete a 60 item questionnaire, Mathematics Supervisor Behavior (MSB), on their own. The completed questionnaires enclosed in a manila envelope were then collected by the researcher within five days. The results were tabulated in an EXCEL spreadsheet and dropped into a SSPP program for further analysis. The questionnaire results were provided as group data, no person could be identified and no reference was made to the school district.

The researcher compiled an observation schedule with a timeline of two months to complete 33 classroom observations of mathematics teachers. Next, the researcher used the "Observation Based Instruction Assessment" (OBIA) classroom observation instrument to gather data about teachers' critical acts in teaching (CAT) math for delivery of skills (i.e. higher order thinking skills) based on the following categories: (1) Warm up session, (2) Problem Solving, (3) Focus Lesson, (4) Differentiated Instruction, (5) Reflection, (6) Homework Review, and (7) Behavior Management. A 1-5 Likert rating scale was used to rate each item (i.e. explains process, asks questions, uses answers, praises) under the first six alphabetized categories mentioned earlier and for the last category, items such as, communicates procedures, rejects answers, criticizes, direct and demands were rated. The rating observation scale used by the researcher consisted of the following: 1= 0-1, 2 = 2-4, 3 = 5-6, 4 = 7-8, 5 = 9 or more facts. The classroom observation process took about two months.

The researcher used the same subjects located at the southern urban school district's four middle schools for collecting study data. Telephone interviews were conducted with the sample to gather teachers' perceptions about effective supervisory behaviors processes and practices. That researcher asked respondents questions over the telephone in the same manner in an attempt to standardize the questioning process. They allow the researcher to assist the respondent (by clarifying questions, asking for follow up questions, encouraging hesitant respondents, and so on), permit a greater amount of follow up (through several callbacks), provide better coverage in certain areas where a personal interviewers often are reluctant to go (Fraenkel & Wallen, 2003, p. 400).

Before conducting the telephone clarification interview, the researcher followed the following post interview protocol (Kvale, 1996):

1. *Knowledgeable*: Has an extensive knowledge of the interview theme, can conduct an informed conversation about the topic; being familiar with its main aspects the interviewer will know what issues are important to pursue, without attempting to shine his or her extensive knowledge.
2. *Structuring:* Introduces a purpose for the interview, outlines the procedures in passing, and rounds off the interview by, for example, briefly telling what learned in he course of the conversation and asking whether the interviewee has any questions concerning the situation.
3. *Clear:* Poses clear, simple, easy, and short questions; speaks distinctly and understandably, does not use academic language or professional jargon.
4. *Gentle:* Allows subjects to finish what they are saying, let's them proceed at their own rate of thinking and speaking.
5. *Sensitive:* Listens actively to the content of what is said, hears the many nuances of meaning in an answer, and seeks to get the nuances of meaning described more fully.
6. *Open:* Hears which aspects of the interview topic are important for the interviewee.
7. *Steering:* Knows what he or she wants to find out.
8. *Critical:* Does not take everything that is said at face value, but questions critically to test the reliability and validity for what the interviewees tell.

9. *Remembering:* Retains what a subject has said during the interview, can recall earlier statements and ask to have them elaborated, and can relate what has been said during different parts of the interview to each other.
10. *Interpreting:* Manages throughout the interview to clarify and extend the meanings of the interviewee's statements. (pp. 148-149)

Each subject was called randomly and asked the same open ended questions. During the telephone interview, all participants representing the sample were asked the same number of clarification questions using the same identical format. There was no variation in the way that data was collected; therefore internal validity was not affected. Activities related to the research study were conducted without adversely affecting the instructional program or the state and local testing programs.

Administrative Procedure

The steps for getting consent to conduct research in a southern urban school district were very thorough and researcher friendly. Once a proposal is submitted it goes through a screening process which is conducted by the Department of Research, Planning and Accountability. Any individual requesting approval of research to be conducted for partial fulfillment of requirements for an advanced degree from an institution of higher education must submit, along with the proposal, written evidence of the approval of the research proposal by the graduate committee or appropriate college or university officials before approval of the study by Justice School District will be considered. The approval letter should be printed on letterhead stationery form the college or university and should state

that the researcher is a student and that the research project is a part of an approved course of study.

Working with Human Subjects

In order to conduct meaningful empirical research with human subjects and receive the services of the Department of Research in a southern urban school district, the researcher had to submit a detailed proposal to the southern urban school district's Department of Research and wait on approval. The guidelines for conducting research activities in the southern urban school district were the following:

1. Research must be in the best interest of the students and the school. Activities related to a research study must be conducted without adversely affecting the instructional program or the state and local testing programs. Research studies cannot be conducted during the core curriculum classes and should be scheduled during noninstructional hours.
2. Research must be acceptable in terms of the values and standards of the school/community. Permission of the principals of the schools involved in the research study is required prior to beginning research activities.
3. Research must be of value to the profession and to the southern urban school district in proportion to the expenditure of time and effort on the part of students, teachers, administrators and staff members participating in the study.
4. Research activities must be severely limited within the school system during certain times of the year because of the state and local testing program, the

beginning and ending of the year activities, and the holidays for students and staff members.

5. Confidential data on individual teachers will not be released. Only aggregate or blind data can be provided.
6. Research studies that have the potential for misinterpretation or misuse of data will not be allowed.
7. The confidentiality of the southern urban school district's students, staff, schools, and the system must be addressed in all research proposals. The use of pseudonyms for people and schools is required in final reports or presentations outside of the southern urban school district.
8. Students, teachers, and other southern urban school district's staff members can participate in research studies only on a volunteer basis.
9. Videotaping and/or audio taping of students cannot be allowed.
10. The Research Screening Committee composed of representatives of the southern urban school district's staff who have particular concerns about the subject area of the proposed research, must review and approve of the research study. Principals must give final approval for research conducted at their school site. (southern urban school district's staff *Guidelines For Conducting Research Activities*, 2004)
11. After receiving such approval from the southern urban school district, the researcher's immediate boss advised her to get written approval from the

principals of the four middle schools to conduct research in the districts' school buildings.

CHAPTER V

DATA ANALYSIS

The MSB Questionnaire, OBIA Classroom Observation Instrument and telephone interview data were used to collect data for this study.

MSB Questionnaire Teacher Rating of the Program by Item by Categories

The responses on the questionnaire were tabulated in simple percentages. The percentages presented were 1 + 2 = Never and a little; 3 = Sometimes; 4 + 5 = Most Times and Always.

1. In the area of supervisor leadership style, did majority of teachers rate (in terms of most and always responses) the mathematics supervisor's post observation conferences?

The data, with respect to this evaluation question, are shown in Table 7.

Overall, the teachers' responses indicated that the majority of teachers moderately (exceeding 50.0% but less than 70%) agreed that in terms of most times and always ratings the mathematics supervisor as: asked for my opinions about the math lessons, encourage me to be in charge, worked in a team in which I feel an equal, and valued my opinions even if different. However, in terms of the mathematics supervisor utilizing the teacher's opinions, ratings of most and always responses dropped to be low 50.0% (48.5%). Specifically, the data suggested that a majority of teachers in a range of 57.6 to 63.6

Table 7

Supervisor Leadership Style (Items 1-5)

	1-2	3	4-5
A. In post observation conferences with the mathematics supervisor:			
1. Conducted the communication process in a two-way manner	30.3	9.1	60.6
2. Worked in a team in which I feel an equal	24.2	12.1	63.6
3. Encouraged me to be in charge	30.3	9.1	60.6
4. Valued my opinions even if different	18.2	18.2	63.6
5. Asked for my opinions about the math lessons	27.3	15.2	57.6
6. Used my opinions on how to get each child to learn math	33.3	18.2	48.5

teachers rated (most and always = 4+5 responses) the mathematics supervisor as: conducting two-way communication (item 1); working in a team as equals (item 2); encouraging the teachers to be in charge (item 3); valuing opinions even if different (item 4); asking about opinions about the mathematics lesson (item 5). Item 6: The mathematics supervisor utilizing the teacher's opinion was below 50.0% (48.5).

2. In the area of assessment, did the teacher rate (in terms of most times and always) the mathematics supervisor asking for their inputs on the learning needs of students?

The data with respect this evaluation question is shown in Table 8.

Table 8

Assessing Student Needs (Items 7-10)

	1-2	3	4-5
B. In post observation conferences with the mathematics supervisor:			
7. Asked me to identify the low achievers (below grade level) in math	9.1	9.1	81.8
8. Asked me to identify students with discipline problems	45.5	21.2	33.3
9. Asked me to identify the causes for students performing below grade level in math	42.4	21.2	36.4
10. Asked me to identify the causes for students having discipline problems	60.6	18.2	21.2

However, teachers rated in a range of 21% to 33.3% that the mathematics supervisor did not ask them to identify the: Discipline problem students in mathematics (item 8), causes for students' performing below grade level in mathematics (item 9) and causes for students having discipline problems (item 10).

The data with respect this evaluation question is shown in Table 9.

Table 9

Instructional Support (Items 11-18)

	1-2	3	4-5
C. In post observation conferences with the mathematics supervisor:			
11. Showed me how the math program would counteract the causes for students not learning math	57.6	12.1	30.3
12. Model how the various stages in the math program teaches so that low achievers and/or discipline problem students could improve their higher order thinking skills	57.6	27.3	15.2
13. Discussed strategies that worked for low achievers or discipline problem students to learn higher order thinking skills during a warm up stage in math	57.6	27.3	15.2
14. Discussed strategies that worked for low achievers or discipline problem students to learn higher order thinking skills during a problem solving stage in math	57.6	27.3	15.2
15. Discussed strategies that worked for low achievers or discipline problem students to learn higher order thinking during a focus lesson stage in math	51.5	30.3	18.2

Table 9 (continued)

		1-2	3	4-5
16.	Discussed strategies that worked for low achievers or discipline problem students to learn higher order thinking skills during a differentiated lesson stage in math	45.5	30.3	24.2
17.	Discussed strategies that worked for low achievers or discipline problem students to learn higher order thinking skills during a reflection stage in math	66.7	18.2	15.2
18.	Discussed strategies that worked for low achievers or discipline problem students to learn higher order thinking skills during a homework phase in math	66.7	15.2	18.2

Specifically, the data suggest that less than majority of the teachers in a range of 15.2 to 30.3 rated (most and always = 4+5 responses) the mathematics supervisor as: showing them how the mathematics program would counteract the causes for students not learning mathematics (item 11); modeling how the various stages in the mathematics program teaches so that low achievers and/or discipline problem students could improve their higher order thinking skills (item 12); discussed strategies that worked for low achievers or discipline problem students to learn higher order thinking skills during a warm up stage in math (item 13); discussed strategies that worked for low achievers or discipline problem students to learn higher order thinking skills during a problem solving

stage in math (item 14); discussed strategies that worked for low achievers or discipline problem students to learn higher order thinking during a focus lesson stage in math (item 15); discussed strategies that worked for low achievers or discipline problem students to learn higher order thinking skills during a differentiated lesson stage in math (16); discussed strategies that worked for low achievers or discipline problem students to learn higher order thinking skills during a reflection stage in math (item 17); and discussed strategies that worked for low achievers or discipline problem students to learn higher order thinking skills during a homework phase in mathematics (18).

Principal's Leadership Style

4. In the area of principal leadership style, did the majority of teachers rate (in terms of most and always responses) the principal and other observers post observation conferences as collaborative?

Table 10

Principal Leadership Style (Items 19-34)

		1-2	3	4-5
D.	In post observation conferences on teaching, the principal and other instructional observers:			
19.	Conducted the communication process in a two-way manner	39.4	15.2	45.5
20.	Worked with teachers as equals	36.4	33.3	30.3

Table 10 (continued)

		1-2	3	4-5
21.	Encouraged teachers to lead and be in charge	36.4	15.2	48.5
22.	Valued differences of opinions even when different from his/her own	39.4	30.3	30.3
23.	Focused on instruction so all students can learn	21.2	18.2	60.6
24.	Asked me to identify aspects that were not effective in the teaching process	48.5	18.2	33.3
26.	Utilized my opinions to change aspects of the lessons that were not working effectively	45.5	21.2	33.3
27.	Asked me to identify the low achievers (below grade level)	15.2	21.2	63.6
28.	Asked me to identify students with discipline problems	33.3	12.1	54.5
29.	Asked me to identify the causes for students performing below grade level	36.4	24.2	39.4
30.	Asked me to identify the causes for students having discipline problems	51.5	18.2	30.3
31.	Discussed teaching strategies for counteracting the causes for students having learning problems	39.4	33.3	27.3

Table 10 (Continued)

	1-2	3	4-5
32. Discussed a variety of teaching strategies for counteracting the causes for students having discipline problems	39.4	27.3	33.3
33. Discussed teaching strategies that worked for low achievers to learn higher order thinking skills	54.5	15.2	30.3
34. Discussed strategies that worked for discipline problem students to become well behaved during instruction	48.5	24.2	27.3

Overall, the data suggested that only a few teachers' responses indicated that they agreed that in terms of most times and always ratings that the principal and other observers: asked me to identify low achievers (below grade level) (item 27); asked me to identify students with discipline problems (item 28); and focused on instruction so all students can learn (item 23).

However, Overall, the data suggested that a majority teachers in a range of 21.2 to 54.5 teachers rated (never ad a little = 1+2 responses) the principal and other observers as: conducting the communication process in a two-way manner (item 19); worked with teachers as equals (item 20); encouraged teachers to lead and be in charge (item 21); valued differences of opinions even when different from his/her own (item 22); focused on instruction so all students can learn(item 23); asked me to identify aspects that were not

effective in the teaching process (item 24); utilized my opinions to change aspects of the lessons that were not working effectively (item 26); asked me to identify the low achievers (below grade level) (item 27); asked me to identify students with discipline problems (item 28); asked me to identify the causes for students performing below grade level (item 29); asked me to identify the causes for students having discipline problems (item 30); discussed teaching strategies for counteracting the causes for students having learning problems (item 31); discussed a variety of teaching strategies for counteracting the causes for students having discipline problems (item 32); discussed teaching strategies that worked for low achievers to learn higher order thinking skills (item 33); and discussed strategies that worked for discipline problem students to become well behaved during instruction (item 34).

Staff Development

5. In the area of staff development, did teachers rate (most times and always responses) the presenters as delivering relevant staff development?

The data with respect to this evaluation question are shown in Table 11.

The data suggest that less than the majority of teachers in a of 9.1 to 54.5 teachers rated (most times ad always = 4+5 responses) the staff development presenters as: practically demonstrated how to identify the causes for students' failure in math (item 35); practically demonstrated how to incorporate higher order thinking skills into daily instruction in math (item 36); practically demonstrated how to utilize evaluation data to make changes in math instruction (item 37); provided opportunities for teachers to give

Table 11

Staff Development

		1-2	3	4-5
E.	At staff development workshops, presenters:			
35.	Practically demonstrated how to identify the causes for students' failure in math	57.6	33.3	9.1
36.	Practically demonstrated how to incorporate higher order thinking skills into daily instruction in math	36.4	27.3	36.4
37.	Practically demonstrated how to utilize evaluation data to make changes in math instruction	33.3	21.2	45.5
38.	Provided materials and explanations while teachers listen with some question and answer session at the end	27.3	18.2	54.5
39.	Provided opportunities for teachers to give opinions on what could work in classrooms and what could not	27.3	27.3	45.5
40.	Model practically steps for implementing intended math strategies	30.3	24.2	45.5
41.	Explained the steps of the method in math, then organized teachers to role play or practice the strategy for application in their classrooms	51.5	27.3	21.2
42.	Conducted follow up on the practice of the new skills in my classroom	66.7	15.2	18.2

opinions on what could work in classrooms and what could not (item 39); model practically steps for implementing intended math strategies (item 40); explained the steps of the method in math, then organized teachers to role play or practice the strategy for application in their classrooms (item 41); and conducted follow up on the practice of the new skills in my classroom (item 42). Item 38: The staff development presenters providing materials and explanations while teachers listen with some question and answer session at the end was over 50.0% (54.5).

Cost Effectiveness of Mathematics Program

6. In the area of cost effectiveness of the mathematics program, did majority of teachers rate (in terms of most times and always responses) that the mathematics program offered greater benefits as compared to the cost?

The data, with respect to this evaluation question, are shown in Table 12.

Table 12

Cost of Mathematics Program

	1-2	3	4-5
F. I think, the scripted math programs:			
43. Are worth the cost when considering the amount of gains made by students who were below grade level	51.5	27.3	21.2
44. Are worth the cost as all or nearly all students below grade level improved to grade level	63.6	18.2	18.2
45. I would recommend the program to other school systems and to other schools within the system	45.5	36.4	18.2

The data suggest that less than the majority of teachers rated (most times and always = 4+5 responses) the cost of the mathematics program as: Are worth the cost when considering the amount of gains made by students who were below grade level (item 43). Are worth the cost as all or nearly all students below grade level improved to grade level (item 44), and I would recommend the program to other school systems and to other schools within the system (item 45).

Student Performance on Class Assignments

7. In the area of student performance on class assignments, did majority of teachers rate (in terms of most times and always) the weak students as making significant gains in mathematics on class assignments?

Table 13

Mathematics Performance on Class Assignments

		1-2	3	4-5
G.	In assessing your students' performances in *MATH*, how many students who were below grade level have significantly:			
46.	Gained knowledge about the basic skills as compared to when they started	18.2	24.2	57.6
47.	Demonstrated the use of higher order thinking skills as compared to when they started	27.3	24.2	48.5
48.	Demonstrated interest in mathematics similar to on or above grade level students	48.5	36.4	15.2

Table 13 (continued)

	1-2	3	4-5
49. Improved achievement level to earn an "A" grade	51.5	48.5	00.0
50. Improved achievement level to earn a "B" grade	39.4	42.4	18.2

The data suggest that a moderate majority of teachers (57.6 %; 4+5 responses) perceive that most times and always weak students had gained knowledge about basic skills as compared to when they started in mathematics (item 46). However, less than a majority of teachers (48.5%; 4+5 responses) perceived that most times and always students demonstrated the use of higher order thinking skills as compared to when they started (item 47). Albeit, barely a majority of teachers (15.2%; 4+5 responses) perceived that most times and always students demonstrated interest in mathematics similar to on or above grade level students (item 48).

Mathematics Performance on Classroom and Standardized Tests

8. In the area of mathematics performance, did a majority of teachers rate (in terms of most times and always) the weak students as making significant gains in mathematics as evidence by classroom and standardized tests?

The data with respect to the evaluation question are showed below in Table 14.

Table 14

Mathematics Performance on Classroom and Standardized Tests

	1-2	3	4-5
H. In your assessment of math performance, how many students who were below grade level have significantly:			
51. Gained knowledge about the basic skills as compared to when they started	15.2	39.4	45.5
52. Demonstrated use of higher order thinking skills as compared to when they started	27.3	48.5	24.2
53. Performed on or above grade level performance on tests	48.5	36.4	15.2
54. Improved achievement level to earn an "A" grade	54.4	39.4	6.1
55. Improved achievement level to earn a "B" grade	48.5	33.3	18.2
56. Regarding student performance on the Criterion-Referenced Competency Test, *estimate or predict* how many students, who were in Level, would now reach the Levels 2 and 3 in math	30.3	39.4	30.3

The data suggest that less than majority of teachers (45.5%; 4+5 responses) rated most times and always weak students had significantly gained knowledge about the basic skills as compared to when they started (item 51). However, less than the majority of teachers (24.2%; 4+5 responses) perceived that most times and always weak students demonstrated use of higher order thinking skills as compared to when they started (item 52).

Student Behavior

9. In the area of student discipline, would the majority of teachers rate (in terms of most times and always) the students with discipline problems as making significant improvement in behavior?

The data, with respect to this evaluation question, are shown in Table 15.

Table 15

Student Behavior

	1-2	3	4-5
I. In your assessment of students' behavior, how many students who were formerly discipline problems:			
57. Have improved their behavior as compared to when they started	39.4	21.2	39.4
58. Have improved their behavior as compared to well behaved students	45.5	24.2	30.3
59. Have not been referred to the office or counselor for discipline	51.5	18.2	30.3
60. Have improved their self-concept and have become self-generated, creative, independent learners	51.5	33.3	15.2

Reducing student behavior problems was not a direct goal of the mathematics program, but a goal of the board of education. Teachers in a range of 15.2 to 39.4 rated in terms of most times and always that 50% to 100% of the students (4+5 scale) who had

behavior problems have made significant improvement (item 57–60). However, teachers, by only 39.4%, (combined 4+5 responses) rated over 50% of the students with behavior problems improved significantly as compared to when they started the program.

Summary

The conclusion is that the program has nothing significantly done to bring 50% of weak students to a basis skill level compared to when they started the program, but not to the level of below average ability students. The widespread distribution of teachers' ratings of supervisors' post observational conference skills indicate a lack of understanding about supervisors conducting post observational conferences with teachers of mathematics.

Although the mathematics supervisor is highly effective in conducting post conferences as it relates to assessing student needs in regards to asking teachers to identify the low achievers (below grade level) in mathematics, the supervisors' effectiveness in conducting conferences with teachers about identifying the causes for students having discipline problems was reflected very low.

The mathematics supervisory behavior questionnaire identified teachers' perceptions of the mathematics supervisors' effectiveness and challenges in conducting post observational conferences that were deemed providing effective instructional support, but barely a majority of mathematics supervisors were able to demonstrate instructional support when conducting post observational conferences with teachers of mathematics. Only 30.3% of teachers perceived the mathematics supervisor was able to conduct post observational conferences which showed teachers how the mathematics program would counteract the causes for student's not learning mathematics. The widespread distribution

of teachers' ratings of supervisors' post observational conference skills indicate a lack of understanding about supervisors conducting post observational conferences as it relates to instructional support.

Principal and other instructional observers effectiveness and challenges in conducting post observational conferences that were collaborative, but barely a majority of principals and other instructional observers were able to introduce collaborative strategies when conducting post observational conferences with teachers of mathematics.

The conclusion is that training was perceived as barely meeting expectations a majority of teachers; however there is room for additional training. Further, training adequacy in the range of 90% to 100% is desired if the implementation of the mathematics program is to be effective for each child.

The majority of teachers perceived no benefits. It might be useful to conduct emergency retraining of teachers on the mathematics program's beliefs, values, purposes, content, and skills in order to promote change in the way the program should be implemented in an effort to ensure that nearly all students below grade level will improve to the next grade level and that a substantial contribution to the board of education's goal that 100% of students will perform at grade level by the end of 2007 is a reality. The program should be reevaluated at the end of next year to determine renewal on a long term basis.

It is evident that there is enough support from the teachers to recommend the probationary continuation of the program on a short term basis. The mathematics programs identified the students' weaknesses in basic skills, but barely a majority of teachers were

able to develop strategies for teaching weak students in order to obtain improvement. Only 48.5% of teachers were able to devise strategies and skills for teaching weak students to make gains in use of higher order thinking skills as compared to when they started. The widespread distribution of teachers' rating of students' performance

Sixty-nine percent of teachers perceive that less than 50% of the students who were below grade level had significantly improved regarding student performance on the Criterion Competency Test. Albeit, the Board of Education goals for 2007 have not been met. Hence, much work is needed in helping these teachers to make the program work for all students.

The conclusion is that although the program was not designed for impacting discipline, nevertheless it has made some useful contribution in reducing problems in the classroom. However, there appeared to be a correspondence between the way teachers rated students' discipline progress and students' academic performance. There is a need for teachers to observe this correspondence through students' profile analysis.

Pearson Correlation

The Pearson Correlation was used to ascertain the significance of each research questions. The analysis was done based on Table 16. The independent variables were supervisor leadership style, assessed need of students, instructional support, and principal leadership style, and staff development, cost effectiveness of materials, teacher knowledge, and teacher higher order thinking skills, student knowledge, and student higher order thinking skills. The dependent variables were student behavior, mathematics and program performance.

Multiple correlations were calculated to evaluate the relationship between teachers' perceptions of supervisory behaviors and student behavior, program and mathematics performance. This final analysis used the Pearson Correlations to determine relationships between independent variables ad dependent variables.

Table 16

Results of the Pearson Correlation Analysis

Independent Variables	MATPERF	PROPERF	STUBEHA
STUBEHA	.438	.308	1.000
Sig. (2 Tailed)	.011*	.082	.000*
SUPSTYL	.209	.319	.218
Sig. (2 Tailed)	.243	.071	.224
ASSESNEE	.283	.283	.132
Sig. (2 Tailed)	.106	.111	.463
INSTRSUP	.288	.537	.266
Sig. (2 Tailed)	.104	.001*	.135
PRINSTYL	.328	.445	.346
Sig. (2 Tailed)	.062	.010*	.049*
STAFFDE	.349	.249	.452
Sig. (2 Tailed)	.047*	.163	.008*
COSTMA	.243	.324	.246
Sig. (2 Tailed)	.172	.066	.168
TCKNOW	-.032	.151	-.055
Sig. (2 Tailed)	.062	.400	.762
TCHOTS	-.131	-.069	-.023
Sig. (2 Tailed)	.469	.703	.898

Table 16 (continued)

Independent Variables	MATPERF	PROPERF	STUBEHA
STUKNO	-.083	-.108	-.064
Sig. (2 Tailed)	.647	.549	.723
STUHOTS	.032	.080	.160
Sig. (2 Tailed)	.860	.658	.375

**Significance at .05 level or less*

Independent Variables: STUBEHA – Student Behavior, SUPSTYL – Supervisor Leadership Style, ASSESNEE – Assessed Needs of Students, INSTRSUP – Instructional Support, PRINSTYL – Principal Leadership Style, STAFFDE – Staff Development, COSTMA – Cost Effectiveness of Materials, TCKNOW – Teacher Knowledge, TCHOTS – Teacher Higher Order Thinking Skills, STUKNO – Student Knowledge, STUHOTS – Students Higher Order Thinking Skills, MATPERF - Mathematics Performance; Dependent Variables: STUPERF – Student Performance and STUBEH –Student Behavior.

The results of the analysis used to answer the following research questions were developed for this study to determine the relationship between the independent and dependent variables presented in this section.

Research Question 1:

1. According to teachers, is there a relationship between principal leadership style and mathematics and program performance and student behavior?

Research Question 1 was addressed by examining the relationship (partial *r)* between the independent and dependent variables:

(a) There is no statistical significant relationship (partial *r)* between principal leadership style and mathematics performance.

(b) There is statistical significant relationship (partial *r)* between principal leadership style and program performance.

(c) There is a statistical significant relationship (partial *r)* between principal leadership style and student behavior.

Research Question 2:

2. According to teachers, is there a relationship between supervisor leadership style and mathematics and program performance and student behavior?

Research Question 2 was addressed by examining the relationship between the independent and dependent variables:

(a) There is no statistical significant relationship (partial *r)* between supervisor leadership style and mathematics performance.

(b) There is no statistical significant relationship (partial *r)* between supervisor leadership style and program performance.

(c) There is no statistical significant relationship (partial *r)* between supervisor leadership style and student behavior.

Research Question 3:

3. According to teachers, is there a relationship between assessed student needs and mathematics and program performance and student behavior?

Research Question 3 was addressed by examining the relationship between the independent and dependent variables:

(a) There is no statistical significant relationship (partial *r)* between assessed student needs and mathematics performance.

(b) There is no statistical significant relationship (partial *r)* between assessed student needs and program performance.

(c) There is no statistical significant relationship (partial *r)* between assessed student needs and student behavior.

Research Question 4:

4. According to teachers, is there a relationship between staff development and mathematics and program performance and student behavior?

Research Question 4 was addressed by examining the relationship between the independent and dependent variables:

(a) There is a statistical significant relationship (partial *r)* between staff development and mathematics performance.

(b) There is no statistical significant relationship (partial *r)* between staff development and program performance.

(c) There is a statistical significant relationship (partial *r)* between staff development and student behavior.

Research Question 5:

5. According to teachers, is there a relationship between instructional support and mathematics and program performance and student behavior?

Research Question 5 was addressed by examining the relationship between the independent and dependent variables:

(a) There is no statistical significant relationship (partial *r)* between instructional support and mathematics performance.

(b) There is a statistical significant relationship (partial *r)* between instructional support and program performance.

(c) There is no statistical significant relationship (partial *r)* between instructional support and student behavior.

Research Question 6:

6. According to teachers, is there a relationship between the cost of materials and mathematics and program performance and student behavior?

Research Question 6 was addressed by examining the relationship between the independent and dependent variables:

(a) There is no statistical significant relationship (partial *r)* between cost of materials support and mathematics performance.

(b) There is no statistical significant relationship (partial *r)* between cost of materials and program performance.

(c) There is no statistical significant relationship (partial *r)* between cost of materials and student behavior.

Research Question 7:

7. According to teachers, is there a relationship between teacher knowledge and mathematics and program performance and student behavior?

Research Question 7 was addressed by examining the relationship between the independent and dependent variables:

(a) There is no statistical significant relationship (partial *r)* between teacher knowledge and mathematics performance.

(b) There is no statistical significant relationship (partial *r)* between teacher knowledge and program performance.

(c) There is no statistical significant relationship (partial *r)* between teacher knowledge and student behavior.

Research Question 8:

8. .According to teachers, is there a relationship between teacher higher order thinking skills and mathematics and program performance and student behavior?

Research Question 8 was addressed by examining the relationship between the independent and dependent variables:

(a) There is no statistical significant relationship (partial *r)* between teacher higher order thinking skills and mathematics performance.

(b) There is no statistical significant relationship (partial *r)* between teacher higher order thinking skills and program performance.

(c) There is no statistical significant relationship (partial *r)* between teacher higher order thinking skills and student behavior.

Research Question 9:

9. According to teachers, is there a relationship between student knowledge and mathematics and program performance and student behavior?

Research Question 9 was addressed by examining the relationship between the independent and dependent variables:

(a) There is no statistical significant relationship (partial *r)* between student knowledge and mathematics performance.

(b) There is no statistical significant relationship (partial *r)* between student knowledge and program performance.

(c) There is no statistical significant relationship (partial *r)* between student knowledge and student behavior.

Research Question 10:

10. According to teachers, is there a relationship between student higher order thinking skills and mathematics and program performance and student behavior?

Research Question 10 was addressed by examining the relationship between the independent and dependent variables:

(a) There is no statistical significant relationship (partial *r)* between student higher order thinking skills and mathematics performance.

(b) There is no statistical significant relationship (partial *r)* between student higher order thinking skills and program performance.

(c) There is no statistical significant relationship (partial *r)* between student higher order thinking skills and student behavior.

Factor Analysis of Independent and Dependent Variables

A factor analysis is a statistical procedure used for placing the variables according to their level of congruence (loading) on interrelationships into factors or communalities.

In Table 17 are represented factor analyses of selected variables on mathematics performance, program performance and student behavior.

Table 17

Factor Analysis

Factor I	Factor II	Factor III	Factor IV	Factor V	Factor VI
T GEND. (-.897)	ASESNEED (.815)	STAFFDEV (.801)	TCKNOW (.803)	T EXP (.770)	FREERL (.727)
PROPERF (.855)	SUPSTYL (.786)	STUBEHAV (.644)	STUHOTS (.775)	T QUAL. (.730)	COSTMAT (.603)
MATHPERF (.594)	FEEDBK (.746)	PRINSTYL (.626)	STUKNOW (.710)	TCHOTS (.661)	
	INSTRSUP (.515)	SCHCRCT (-.506)			

(TGEND.)Teacher Gender, (PROGPERF) Program Performance, (MATHPERF) Mathematics Performance, (ASESNEED) Assessing Student Needs, (SUPSTLY) Supervisory, (FEEDBK) Feedback, (INSTRSUP) Instructional Support, (STAFFDEV) Staff development, (STUBEHAV) Student Behavior, (PRINSTLY) Principal Leadership Style, (SCHCRCT) School Criterion Reference Competency Test, (TCKNOW) Teacher Knowledge, (STUHOTS) Student Higher Order Thinking Skills, (STUKNOW) Student Knowledge, (T EXP) Teacher Experience, (T QUAL.) Teacher Qualification, (TCHOTS) Teacher Higher Order Thinking Skills, (FREERL) Free and Reduced Lunch, and (COSTMAT) Cost of Mathematics Program.

Rotated Component Matrix (i.e. Extraction Method: Principal Component Analysis and Rotation Method: Varimax with Kaiser Normalization: a. Rotation converged in 9 iterations).

In what factors would be placed the dependent variables such as program performance, student mathematics performance, student behavior, school CRCT, and what would be the associated independent variable?

In Factor I were placed: Program performance, mathematics performance and gender. The results indicated that only two dependent variables, program and mathematics performance were placed in Factor I and gender was placed inversely.

In Factor II as the independent variables were placed assessed needs, supervisory style of the mathematics teacher, feedback and instructional support. Therefore, these independent variables did not have a direct impact on the dependent variables.

In Factor III were placed: Staff development, student behavior, principal leadership style, and school CRCT. Therefore, the dependent variable, student behavior was associated with staff development, student behavior, principal leadership style, and school CRCT. It would appear that higher rating of staff development was associated with higher rating of student behavior and principal leadership. However, the higher the school performance on the CRCT has an inverse relationship (negative sign), with staff development, student behavior and principal leadership style.

In Factor IV were placed: Teacher knowledge, student higher order thinking skills and student knowledge indicating that the output on the transaction process of the class was not associated with the dependent variables.

In Factor V were placed: Teacher experience, teacher qualifications and teacher higher order

In Factor VI were placed: Free and reduced lunch and cost of mathematics program indicating that teachers in high free lunch status schools perceived the mathematics program as cost effective.

Summary

There were statistically significant relationships among principal leadership and program performance, principal leadership and student behavior, staff development and mathematics performance, staff development and student behavior, and instructional support and program performance.

Telephone Interviews

Although the southern urban school district's participant's responses were wide and varied, a consensus was identified on several key themes. Teachers perceived the following as causes for some students not learning mathematics as expected:

- Students lacked fundamental skills
- Students were told at a early age that mathematics was hard, therefore students have low self-esteem in a mathematics classroom
- Incorrect teaching methods
- No parental support
- Students are below grade level
- Students' minds are not focused on mathematics
- Mathematics program moves too quickly
- Class size

Teachers perceived the following about the mathematics program overcoming or counteracting the causes sited above:

- Mathematics tutors within the classroom

- Variety of manipulatives
- Hands-on activities
- Resources

Teachers perceived the following about the way mathematics supervisor conducted the feedback session:

- Feedback was positive and consistent
- Constructive criticism
- Good lesson suggestions

Teachers perceived the following about the way mathematics supervisor conducted the feedback session:

- Does not provide real life connections to the classroom
- No suggestions are given when problems arise to help students right away
- Teacher suggestion are not accepted
- When feedback sessions are one sided

Teachers perceived the following about the mathematics model in the following areas:

	Like	Dislike
(a) Warm up session	76%	24%
(b) Problem solving session	70%	30%
(c) Focus lesson	79%	21%

	Like	Dislike
(d) Differentiated instruction	73%	27%
(e) Reflection	76%	24%
(f) Homework review	73%	27%

CHAPTER VI

FINDINGS, CONCLUSIONS, IMPLICATIONS, AND RECOMMENDATIONS

Summary of Findings

Chapter VI will focus on four segments: findings, conclusions, implications and recommendations. The findings addressed research questions, which covered eight primary dimensions rated by teachers of mathematics: supervisor and principal leadership style, assessed student needs, staff development, cost of scripted mathematics program, program performance, mathematics performance and student behavior in the mathematics classroom. The participants represented low, medium and high performing schools in a southern urban school district. The findings are presented under topic headings with analyses supported by the raw data.

Principal Leadership Style

Overall, the MSB Questionnaire data suggested that only a few teachers' responses indicated that they agreed that in terms of most times and always ratings that the principal and other observers: asked them to identify low achievers (below grade level), asked them to identify students with discipline problems, and focused on instruction so all students can learn.

However, the data suggested that a majority teachers in a range of 27.3 to 63.6 teachers rated most times and always as: Conducting the communication process in a two-way manner, worked with teachers as equals, encouraged teachers to lead and be in charge, valued differences of opinions even when different from his/her own, focused on instruction so all students can learn, asked them to identify aspects that were not effective in the teaching process, utilized their opinions to change aspects of the lessons that were not working effectively, asked them to identify the low achievers (below grade level), asked them to identify students with discipline problems, asked them to identify the causes for students performing below grade level, asked them to identify the causes for students having discipline problems, discussed teaching strategies for counteracting the causes for students having learning problems, discussed a variety of teaching strategies for counteracting the causes for students having discipline problems, discussed teaching strategies that worked for low achievers to learn higher order thinking skills, and discussed strategies that worked for discipline problem students to become well behaved during instruction.

It was also found that there was a significant relationship between principal leadership style and program performance and student behavior.

Mathematics Supervisor Leadership Style

The majority of teachers moderately (exceeding 50.0%, but less than 70%) agreed that in terms of most times and always ratings that the mathematics supervisor conducted the communication process in a two-way manner, worked in a team in which they felt

equal, encouraged them to be in charge, and valued their opinions about the mathematics lessons.

However, in terms of the mathematics supervisor using their opinions on how to get each child to learn mathematics, ratings of most and always responses dropped to be low 50.0% (48.5%).

Assessed Student Needs

The data suggest that teachers rated in terms of most times and always the mathematics supervisor (81.8%) with respect to asking them to identify the low achievers who were below grade level in mathematics in mathematics. However, teachers rated in a range of 21.0 to 33.3 teachers that the mathematics supervisor did not ask them to identify the: discipline problem students in mathematics, causes for students' performing below grade level in mathematics, and causes for students having discipline problems.

Instructional Support

Specifically, the data suggest that less than majority of the teachers in a range of 15.2 to 30.3 rated (most and always responses) the mathematics supervisor as: showing them how the mathematics program would counteract the causes for students not learning mathematics, modeling how the various stages in the mathematics program teaches so that low achievers and/or discipline problem students could improve their higher order thinking skills, discussed strategies that worked for low achievers or discipline problem students to learn higher order thinking skills during a warm up stage in math, discussed strategies that worked for low achievers or discipline problem students to learn higher order thinking

skills during a problem solving stage in math, discussed strategies that worked for low achievers or discipline problem students to learn higher order thinking during a focus lesson stage in math, discussed strategies that worked for low achievers or discipline problem students to learn higher order thinking skills during a differentiated lesson stage in math, discussed strategies that worked for low achievers or discipline problem students to learn higher order thinking skills during a reflection stage in math, and discussed strategies that worked for low achievers or discipline problem students to learn higher order thinking skills during a homework phase in mathematics.

It was also found that there was a significant relationship between instructional support and program performance.

Staff Development Presenters

The data suggested that less than the majority of teachers in a range of 9.1 to 54.5 teachers rated most times and always the staff development presenters as: practically demonstrated how to identify the causes for students' failure in math, practically demonstrated how to incorporate higher order thinking skills into daily instruction in math, practically demonstrated how to utilize evaluation data to make changes in math instruction, provided opportunities for teachers to give opinions on what could work in classrooms and what could not, model practically steps for implementing intended math strategies, explained the steps of the method in math, then organized teachers to role play or practice the strategy for application in their classrooms, and conducted follow up on the practice of the new skills in my classroom.

Although the majority of teachers agreed that the staff development presenters providing materials and explanations while teachers listen with some question and answer session at the end was over 50.0% (54.5%).

It was also found that there was a significant relationship between staff development and mathematics performance and student behavior.

Cost of Scripted Mathematics Program

The data suggested that less than the majority of teachers in a range of 18.2 to 21.2 teachers rated most times and always the cost of the mathematics program as: are worth the cost when considering the amount of gains made by students who were below grade level, are worth the cost as all or nearly all students below grade level improved to grade level, and I would recommend the program to other school systems and to other schools within the system.

Overall, the majority of the teachers in a range of 45.5 to 63.6 agreed, rated never and a little the cost of the mathematics program as: I would recommend the program to other school systems and to other schools within the system, are worth the cost when considering the amount of gains made by students who were below grade level, and are worth the cost as all or nearly all students below grade level improved to grade level.

Program Performance

The data suggests that the teachers in a range of 15.2 to 57.6 teachers agreed that most times and always that students who were below grade level have significantly: demonstrated interest in mathematics similar to on or above grade level students, improved

achievement level to earn a "B" grade, demonstrated the use of higher order thinking skills as compared to when they started the program, and gained knowledge about the basis skills as compared to when they started the program.

Albeit, a moderately majority of teachers (51.5%) perceived never and a little that students who were below grade level have significantly: improved achievement level to earn an "A." Furthermore, less than 50% (48.5%) of teachers agreed that never and a little that students who were below grade level have significantly: demonstrated interest in mathematics similar to on or above grade level students.

Mathematics Performance

The data suggested that less than majority of teachers (45.5%) perceived that most times and always weak students had significantly gained knowledge about the basic skills as compared to when they started.

However, less than the majority of teachers (24.2%) perceived that most times and always weak students demonstrated use of higher order thinking skills as compared to when they started. The conclusion is that the program has done nothing significantly to bring 50% of weak students to a basis skill level compared to when they started the program, but not to the level of below average ability students.

Student Discipline

Reducing student behavior problems was not a direct goal of the mathematics program, but a goal of the board of education. Teachers in a range of 15.2 to 39.4 rated that 50% to 100% of the students who had behavior problems have made significant

improvement. However, teachers, by only 39.4%, rated over 50% of the students with behavior problems improved significantly as compared to when they started the program.

Positive and Negative Factors that Influenced Mathematics Performance, Program Performance, and Student Behavior

The teachers who taught at the low, medium ad high middle schools in the southern urban school district expressed several factors that most influenced program performance, mathematics performance and student behavior. Most of the factors derived from examining teachers' perceptions and principal and mathematics supervisor leadership style, staff development presenters, instructional support, mathematics and program performance and student behavior centered.

Positive factors affecting mathematics and program performance and student behavior are as follows:

1. Class size
2. Mathematics tutors within the classroom
3. Variety of manipulatives
4. Hands-on activities
5. Resources
6. Positive and consistent feedback
7. Constructive criticism
8. Good lesson suggestions
9. Real life connections to the classroom
10. Suggestions for helping students right away

11. Accepting teacher suggestions
12. Implementing research best practices in the mathematics classroom, such as warm up, problem solving, focus learning, differentiated instruction, reflection, and homework review

Negative Factors affecting mathematics and program performance and student behavior are as follows:

1. Students lacked of fundamental skills
2. Students were told at a early age that mathematics was hard, therefore students have low self esteem in a mathematics classroom
3. Incorrect teaching methods
4. No parental support
5. Students are below grade level
6. Students' minds are not focused on mathematics
7. Mathematics program moves too quickly
8. Class size
9. One sided feedback sessions

It is imperative to remember that when principals, instructional observers and mathematics supervisors model positive behaviors with teachers of mathematics one will witness an adaptive change toward teacher self efficacy and empowerment which will make a significant impact on mathematics and program performance and student discipline. On the other hand, some supervisory behaviors if perceived negatively by teachers hinder teachers moving toward self efficacy.

Conclusions

Today, more productive approaches to researching the effectiveness of supervisory behaviors are becoming better known. Quantitative and qualitative analysis of this research study was promising and lead to valuable insights with practical significance.

The findings of this study validated that some positive ad negative clusters supervisory behaviors, such as principal leadership style, supervisor leadership style, assessed student needs, instructional support, and staff development practiced by principals, instructional observers and mathematics supervisors in the southern urban school district understudied. It is obvious that greater clarity about the definition and functioning of effective supervisory behavior efforts rests in developing stronger theories of connecting practices with results (Guskey & Sparks, 1996).

The examination of the independent and dependent variables relationships in this study showed that, in some cases, the particular supervisory behaviors of principals, instructional observers and mathematics supervisor are not as important as managing change.

Implications

The findings and conclusions of this study contained the following implications for educators relating to improving mathematics and program performance and student achievement:

1. Principals, instructional observers and mathematics supervisors need to be aware of the positive and negative supervisory behaviors and how to reflective

on their behavior exhibited during post conferences with teachers of mathematics.

2. Principals, instructional observers, and mathematics supervisors must be able to show and communicate to teachers how the CSR and traditional mathematics program could counteract the causes for students not learning mathematics.
3. This research forms some basis for principal and supervisors of mathematics professional development frameworks relative to pedagogy, principal and mathematics supervisors leadership styles, supervision models, instructional support for teachers, and assessing student needs.
4. The data collection process used in this study can be a model for urban middle schools who want to improve mathematics and program performance as well as student behavior.
5. This study provides research data for school boards and human resources departments to use for setting their policies relative to hiring and placement of middle school principles.
6. Information from this research serves as a curriculum framework for higher education institutions, which would be characteristics of an effective and noneffective supervisor of mathematics.

Recommendations

Area Superintendent

1. Provide principals and central office staff with leadership style strategy training in order to support teachers of mathematics during the post conference:

- Communicating in a two way manner.
- Working with teachers as equals.
- Encouraging teachers to lead and be in charge.
- Valuing teachers' differences of opinions even when different from his/her own.
- Focusing on instruction so all students can learn.
- Asking teachers to identify aspects that were not effective in the teaching process.
- Utilizing teachers' opinions to change aspects of the lessons that were not working effectively.
- Asking teachers to identify students with discipline problems.
- Asking teachers to identify the causes for students performing below grade level.
- Asking teachers to identify the causes for students having discipline problems.
- Discussing teaching strategies for counteracting the causes for students having learning problems.
- Discussing a variety of teaching strategies for counteracting the causes for students having discipline problems
- Discussed teaching strategies that worked for low achievers to learn higher order thinking skills

- Discussed strategies that worked for discipline problem students to become well behaved during instruction

2. Provide principals and central office staff with staff developers strategy training in the following areas:
   - Demonstrating to teachers how to identify the causes for students' failure in mathematics
   - Demonstrating to teachers how to incorporate higher order thinking skills into daily instruction in mathematics
   - Demonstrating to teachers how to utilize evaluation data to make changes in mathematics instruction
   - Providing materials and explanations while teachers listen with some question and answer session at the end
   - Providing opportunities for teachers to give opinions on what can work in classrooms and what can not
   - Modeling steps for implementing intended mathematics strategies
   - Explaining the steps of the method in mathematics, then organizing teachers to role play or practice the strategy for application in their classrooms
   - Conducting follow up on the practice of the new skills in teachers' classrooms
3. Commission a team of mathematics curriculum experts to examine CSR and non-CSR lesson plans to determine adequacy of preparation and alignment to state mandated standards and assessment/evaluation.

4. Establish a professional support network for school leaders.
5. Put in place systemic processes for making sure teachers acquire the knowledge, skills and disposition to effectively move teaching and learning to a higher level which can impact mathematics performance, program performance and student behavior:
    a. A prescriptive supervisory behavior model (SBM) with the aim of:
        i. Sharing effective supervisory behavior approaches
        ii. Instructional support for teachers of mathematics
        iii. Productive teacher feedback
        iv. Building a collegial atmosphere
        v. Transforming ineffective mathematics classroom instruction
        vi. Influencing teacher motivation
        vii. Providing effective professional development for instructional leaders to correct any negative perceptions teachers have about the impact of supervision in urban school districts

Principals

1. Provide assistant principals, mathematics supervisors and instructional specialist with leadership style strategy training in order to support teachers of mathematics during the post conference:
    - Communicating in a two way manner
    - Working in a team where teachers can feel an equal
    - Encouraging teachers to be in charge

- Valuing teachers' opinions even if different.
- Asking teachers for opinions about the mathematics lesson.
- Using teachers' opinions on how to get each child to learn mathematics.

2. Provide assistant principals, mathematics supervisors and instructional specialist with assessed student needs strategy training in order to support teachers of mathematics during the post conference:
   - Asking teachers to identify students with discipline problems.
   - Asking teachers to identify the causes for students performing below grade level in mathematics.
   - Asking teachers to identify the causes for students having discipline problems.
3. Provide assistant principals, mathematics supervisors and instructional specialist with instructional support strategy training in order to support teachers of mathematics during the post conference:
   - Showing the teacher how the mathematics program will counteract the causes for students not learning math
   - Modeling how the various stages in the math program teaches so that low achievers and/or discipline problem students can improve their higher order thinking skills
   - Discussing strategies that work for low achievers or discipline problem students to learn higher order thinking skills during a warm up stage in math

- Discussing strategies that work for low achievers or discipline problem students to learn higher order thinking skills during a problem solving stage in math
- Discussing strategies that work for low achievers or discipline problem students to learn higher order thinking during a focus lesson stage in math
- Discussing strategies that work for low achievers or discipline problem students to learn higher order thinking skills during a differentiated lesson stage in math
- Discussing strategies that work for low achievers or discipline problem students to learn higher order thinking skills during a reflection stage in math
- Discussing strategies that work for low achievers or discipline problem students to learn higher order thinking skills during a homework phase in math

4. Provide assistant principals, mathematics supervisors and instructional specialist staff developers strategy training in the following areas:
   - Demonstrating to teachers how to identify the causes for students' failure in mathematics
   - Demonstrating to teachers how to incorporate higher order thinking skills into daily instruction in mathematics
   - Demonstrating to teachers how to utilize evaluation data to make changes in mathematics instruction

- Providing materials and explanations while teachers listen with some question and answer session at the end
- Providing opportunities for teachers to give opinions on what can work in classrooms and what can not
- Modeling steps for implementing intended mathematics strategies
- Explaining the steps of the method in mathematics, then organizing teachers to role play or practice the strategy for application in their classrooms
- Conducting follow up on the practice of the new skills in teachers' classrooms

Comprehensive Reform Personnel

1. Comprehensive school reform personnel need to provide mathematics teachers with the student achievement benefits of the scripted mathematics program to ensure teacher by-in concerning:
   - The cost when considering the amount of the gain made by students who were below grade level
   - The cost as all or nearly all students below grade level improved to grade level
   - Recommending the program to other school systems and to other schools within the system

All Instructional Leaders

1. Use these research findings as a catalyst for further examination and collection of data relative to teacher perceptions of supervisory behaviors to improve mathematics achievement in the classroom environment in all middle schools.

Policy Makers

1. Expand Title I legislation to include principal professional development.

APPENDIX A

TEACHER: Observation Based Instructional Assessment (OBIA) MATH CYCLE

Teacher ID: **Grade Level:** **Subject Area:** **Date:**

ACTION	TEACHER OUTCOMES			Students' Outcomes		
Teacher critical acts in teaching (CAT) MATH for delivery of knowledge, skills & dispositions	KNOWLEDGE & Comprehension	Higher Order Thinking Skills	Dispositions	KNOWLEDGE & Comprehension	Higher Order Thinking Skills	Dispositions
A. Warm-Up Session						
1. Explains process	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
2. Asks question	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
3. Uses Answers, praises	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
B. Problem-Solving:						
1. Explains content	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
2. Asks questions	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
3. Uses Answers, praises	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
C. Focus-Lesson:						
1. Explains	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
2. Asks questions	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
3. Uses answers, praises	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
D. Differentiated Instruction:						
1. Explains	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
2. Asks questions	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
3. Uses answers, praises	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
E. Reflection:						
1. Explains	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
2. Asks questions	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
3. Uses answers, praises	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
F. Homework Review:						
1 Explains	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
2. Asks questions	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
3 Uses answers, praises	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
G. Behavior Management:						
1. Communicates procedures	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
2. Rejects answers, criticizes, directs, commands	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5

Rating scale: Observations of acts: 1 = 0-1; 2 = 2-4; 3 = 5-6; 4 = 7-8; 5 = 9 or more

An act = a complete statement carrying a meaning: Yes and no are complete statements carrying meanings.

Lower order thinking skills: Knowledge = Recall of facts, Comprehension = literal meanings, paraphrasing

Higher order thinking skills: application, analysis, synthesis (inferences), evaluation

Dispositions: right and wrong values. Belief in justice, tolerance of different opinions, respect for others, change, etc

APPENDIX B

MSB Questionnaire

Dear Faculty Members:

I am conducting research for the doctorate in education at Clark Atlanta University. Therefore, I am interested in your opinion from a purely research basis. Please provide your opinion anonymously. The results will be provided as group data, no person can be identified and no reference will be made to your school or school system.

I am grateful for your consideration and assistance.

Signature_____

Directions: Please check *ONE* response only for each item from the following possible responses.

1=Never 2=A Little 3=Sometimes 4=Most Times 5=Always

Please write one response per item	1	2	3	4	5
In post-observation conferences with the Mathematics Supervisor:					
1. Conducted the communication process in a two-way manner					
2. Worked in a team in which I feel an equal					
3. Encouraged me to be in charge					
4. Valued my opinions even if different					
5. Asked for my opinions about the math lessons					
6. Used my opinions on how to get each child to learn math					
7. Asked me to identify the low achievers (below grade level) in math					
8. Asked me to identify students with discipline problems					
9. Asked me to identify the causes for students performing below grade level in math					
10. Asked me to identify the causes for students having discipline problems					

Appendix B (continued)

	1	2	3	4	5
11. Showed me how the math program would counteract the causes for students not learning math					
12. Model how the various stages in the math program teaches so that low achievers and/or discipline problem students could improve their higher order thinking skills					
13. Discussed strategies that worked for low achievers or discipline problem students to learn higher order thinking skills during a warm-up stage in math					
14. Discussed strategies that worked for low achievers or discipline problem students to learn higher order thinking skills during a problem-solving stage in math					
15. Discussed strategies that worked for low achievers or discipline problem students to learn higher order thinking during a focus-lesson stage in math					
16. Discussed strategies that worked for low achievers or discipline problem students to learn higher order thinking skills during a differentiated lesson stage in math					
17. Discussed strategies that worked for low achievers or discipline problem students to learn higher order thinking skills during a reflection stage in math					
18. Discussed strategies that worked for low achievers or discipline problem students to learn higher order thinking skills during a homework phase in math					
In post-observation conferences on teaching, the Principal and other instructional observers:	1	2	3	4	5
19. Conducted the communication process in a two-way manner					
20. Worked with teachers as equals					
21. Encouraged teachers to lead and be in charge					
22. Valued differences of opinions even when different from his/her own					
23. Focused on instruction so all students can learn					
24. Asked me to identify aspects that were not effective in the teaching process					
26. Utilized my opinions to change aspects of the lessons that were not working effectively					
27. Asked me to identify the low achievers (below grade level)					
28. Asked me to identify students with discipline problems					

Appendix B (continued)

	1	2	3	4	5
29. Asked me to identify the causes for students performing below grade level					
30. Asked me to identify the causes for students having discipline problems					
31. Discussed teaching strategies for counteracting the causes for students having learning problems					
32. Discussed a variety of teaching strategies for counteracting the causes for students having discipline problems					
33. Discussed teaching strategies that worked for low achievers to learn higher order thinking skills					
34. Discussed strategies that worked for discipline problem students to become well-behaved during instruction					
At staff development workshops, Presenters:					
35. Practically demonstrated how to identify the causes for students' failure in math					
36. Practically demonstrated how to incorporate higher order thinking skills into daily instruction in math					
37. Practically demonstrated how to utilize evaluation data to make changes in math instruction					
38. Provided materials and explanations while teachers listen with some question and answer session at the end					
39. Provided opportunities for teachers to give opinions on what could work in classrooms and what could not					
40. Model practically steps for implementing intended math strategies					
41. Explained the steps of the method in math, then organized teachers to role-play or practice the strategy for application in their classrooms					
42. Conducted follow-up on the practice of the new skills in my classroom					
I think, the scripted math programs:	1	2	3	4	5
43. Are worth the cost when considering the amount of gains made by students who were below grade level					
44. Are worth the cost as all or nearly all students below grade level improved to grade level					
45. I would recommend the program to other school systems and to other schools within the system					

Appendix B (continued)

In this section, please use the following scale:

1 = No student; 2 = A Few students; 3 = Some students; 4 = Most students;
5 = All or almost all students

Please write one response per item	1	2	3	4	5
In assessing your students' performances in MATH, how many students who were below grade level have significantly:					
46. Gained knowledge about the basic skills as compared to when they started					
47. Demonstrated the use of higher order thinking skills as compared to when they started					
48. Demonstrated interest in reading similar to on or above grade level students					
49. Improved achievement level to earn an "A" grade					
50. Improved achievement level to earn a "B" grade					
In your assessment of Math performance, how many students who were below grade level have significantly:					
51. Gained knowledge about the basic skills as compared to when they started					
52. Demonstrated use of higher order thinking skills as compared to when they started					
53. Performed on or above grade level performance on tests					
54. Improved achievement level to earn an "A" grade					
55. Improved achievement level to earn a "B" grade					
56. Regarding student performance on the Criterion-Referenced Competency Test, *estimate or predict* how many students, who were in Level, would now reach the Levels 2 and 3 in math					
In your assessment of students' behavior, how many students who were formerly discipline problems:					
57. Have improved their behavior as compared to when they started					
58. Have improved their behavior as compared to well behaved students					
59. Have not been referred to the office or counselor for discipline					
60. Have improved their self-concept and have become self-generated, creative, independent learners					

Appendix B (continued)

Demographics:

61. How many times did your Math Facilitator observe you teaching in this academic? year? _____

62. How many times did your Math Facilitator/Supervisor in this academic year meet? with you to offer feedback on your teaching in math? _____

63. Please estimate, how many students in your class are on free or reduced lunch:

    [ ] 0-10%; [ ] 11-20%; [ ] 21-30%; [ ] 31-40%; [ ] 41-50%; [ ] 51-60%; [ ] 61-70%; [ ] 71-80%; [ ] 81-90%; [ ] 91-100%.

64. Please check your teaching experience: [ ] 1-2 Years; [ ] 3-5 Years; [ ] 6-10 years; [ ] 11-15 Years; [ ] 16-20 Years; [ ] 21 or above years.

65. Please check your qualifications: [ ] 1. Bachelor's degree and teacher certifications [ ] 2. Master's degree; [ ] 3. Master's degree and additional courses; [ ] 4. ED. S or above

66. Please check your gender: [ ] 1. Male; [ ] 2. Female

APPENDIX C

Telephone Interview Questions

1. What are the causes for some students not learning math as expected?

2. Think of your math program, how does it overcome or counteract the causes of the causes you cited? Explain:

3. Think about your Math Facilitator/ Supervisor:

   A. What do you *like about* the way he conducts the Feedback Session?
   B. What do you *dislike about* the way he conducts the Feedback Session?

4. How do you feel about the math model in the following areas?

   A. Warm-up session?
      1. Like
      2. Dislike

   B. Problem-Solving session?
      1. Like
      2. Dislike

   C. Focus lesson?
      1. Like
      2. Dislike

   D. Differentiated instruction?
      1. Like
      2. Dislike

   E. Reflection?
      1. Like
      2. Dislike

   F. Homework review?
      1. Like
      2. Dislike

APPENDIX D

Letter Requesting Permission to Conduct Research

Our Focus...Student Success

ATLANTA PUBLIC SCHOOLS

K-8 School Reform Team-1
J.C. Hayden Building
1444 Lucille Avenue, S.W.
Atlanta, Georgia 30310

Dr. Sharon D. Davis
Executive Director

404-752 0700
404-753-8891 Fax

Dr. Nancy Emmons, Research Associate
Department of Research and Accountability Department
Center for Leadership and Learning
130 Trinity Ave
Atlanta, Georgia 30331

Dear Dr. Emmons and RPA Committee:

My name is Arica Johnson, Atlanta Public Schools (APS), SRT-1, K-8 Model Teacher Leader/Facilitator of Mathematics and Science. Presently, I am a candidate for the doctorate of education at Clark Atlanta University and request your permission to conduct research in Atlanta Public Schools for partial fulfillment of requirements for an advanced degree. I am enclosing the documents you have requested in order to conduct empirical research in Atlanta Public Schools:

- Letter of approval from Clark Atlanta University indicating that I am a student and that my research project is a part of an approved course of study
- 6 copies of the proposal
- 6 copies of each instrument and protocols

This research proposal has the promise of improving the instructional program, student achievement, and producing additional knowledge relevant to the field of education. This proposal reflects the district's targets and goals for middle school mathematics for the school system and has the best interest of the instructional staff at the following schools (i.e. Sylvan, Kennedy, Bunche, and Brown Middle Schools).

I will wait on an approval letter from your department and obtain permission from the above mentioned school principals before beginning the proposed research study. The research I am proposing will definitely be a value to the profession and to APS. I fully understand that the only data release for the purpose of this study will be aggregate and that the confidentiality of APS teachers, schools, and the system will be addressed in this research proposal. The use of pseudonyms for people and schools will be used in final reports or presentations outside of APS.

Please note at the completion of the study a copy of the final report shall be submitted to your department of Research, Planning, and Accountability. If you need to contact me for any reason, please feel free to do so at 404-756-5163 (O), 678-570-4857 (Cell), 770-632-9347 (H), and/or email me at arjohnson@atlanta.k12.ga.us or arica185@mindspring.com. I look forward to conducting empirical research in Atlanta Public Schools.

Sincerely,

Arica R. Johnson
SRT-1,K-8 Model Teacher of Mathematics and Science

APPENDIX E

Letters Granting Permission to Conduct Research

ATLANTA PUBLIC SCHOOLS

Our Focus...Student Success

RESEARCH, PLANNING AND ACCOUNTABILITY
130 TRINITY AVENUE, S.W.
7TH FLOOR
ATLANTA, GEORGIA 30303-3624

404-802-2780
404-802-1719 FAX

February 3, 2005

Ms. Arica Johnson, Model Teacher Leader
SRT-I
J. C. Harris Building
1444 Lucille Avenue, S.W.
Atlanta, Georgia 30310

Dear Ms. Johnson:

Your request to conduct research within the Atlanta Public Schools (APS) was reviewed by the Research Screening Committee in accordance with the guidelines. Your research study entitled "Teachers of Mathematics Perceptions about the Impact of Supervisory Behaviors on Student Achievement" was approved under the following conditions:

1. Your study is confined in APS to Sylvan, Kennedy, Bunche, and Brown Middle Schools. You must obtain the approvals of the principals of the selected schools prior to beginning your research study. Principals have the final approval on whether research studies are conducted in their schools. If any of the principals of the selected schools do not approve of your study or do not believe that it is in the best interest of their schools to participate, you may select comparable APS middle schools as replacements with the principals' approvals not to exceed a total of four middle schools.
2. Your research design involves a sample of middle school teachers drawn from the four schools selected for your study. You plan to use teacher questionnaires, telephone interviews, and teacher observations based on mathematics instruction rubrics to collect the data for your study.
3. No students will be directly involved in your research study.
4. Activities related to your research study are intrinsic to the ongoing instructional program in the classroom, but must not interfere with the state and local testing programs. Observations must be unobtrusive. Teacher interviews and questionnaires must be conducted during noninstructional hours.
5. The confidentiality of students, teachers, other APS staff members, the schools, and the school system must be ensured. Pseudonyms for people and the school, as well as references to APS as "a large urban school system," are required in the title and text of your final report before publication or presentation outside of APS.
6. Teachers and other APS employees can participate in or assist with your research study only on a voluntary basis.
7. The data collection phase of your research study must be completed by the end of the 2005 calendar year.
8. If changes are made in the research design or in the instruments used, you must notify the Department of Research, Planning, and Accountability prior to beginning your study.

This letter serves as official notification of the approval of your proposed research study, pending the above conditions. Remember that a copy of the results of your completed study must be submitted to the Department of Research, Planning, and Accountability. Please contact me at (404) 802-2708 or nemmons@atlanta.k12.ga.us if I can be of further assistance.

Sincerely,

Nancy J. Emmons, Ph.D.
Research Associate

NJE:dd - #220

xc: Mr. Lester McKee
Dr. Sharon D. Davis
Principals (Sylvan, Kennedy, Bunche, Brown)

Appendix E (continued)

February 13, 2005

Mrs. Arica R. Johnson
SRT-1, Model Teacher Leader/Facilitator
1444 Lucille Avenue
Atlanta, Georgia 30311

Dear Mrs. Johnson:

I received a letter from Research, Planning, and Accountability about your study on the following topic *"Teachers of Mathematics Perceptions about the Impact of Supervisory Behaviors on Student Achievement."*

I understand your study's research design involves a sample of middle school regular education and program for exceptional children mathematics teachers at my school site and that the confidentiality of students, teachers, other APS staff members, the schools, and the school system will be ensured.

Mrs. Johnson I would like for this letter to serve as official notification that as the principal of Kennedy Middle School, I grant you approval to begin your research studies at our school.

Sincerely,

Mr. Rickey Dixon
Principal of Kennedy Middle School

Appendix E (continued)

February 13, 2005

Mrs. Arica R. Johnson
SRT-1, Model Teacher Leader/Facilitator
1444 Lucille Avenue
Atlanta, Georgia 30311

Dear Mrs. Johnson:

I received a letter from Research, Planning, and Accountability about your study on the following topic *"Teachers of Mathematics Perceptions about the Impact of Supervisory Behaviors on Student Achievement."*

I understand your study's research design involves a sample of middle school regular education and program for exceptional children mathematics teachers at my school site and that the confidentiality of students, teachers, other APS staff members, the schools, and the school system will be ensured.

Mrs. Johnson I would like for this letter to serve as official notification that as the principal of Brown Middle School, I grant you approval to begin your research studies at our school.

Sincerely,

S. Riley-Ordu

Dr. Sharon Riley-Ordu
Principal of Brown Middle School

Appendix E (continued)

February 13, 2005

Mrs. Arica R. Johnson
SRT-1, Model Teacher Leader/Facilitator
1444 Lucille Avenue
Atlanta, Georgia 30311

Dear Mrs. Johnson:

I received a letter from Research, Planning, and Accountability about your study on the following topic *"Teachers of Mathematics Perceptions about the Impact of Supervisory Behaviors on Student Achievement."*

I understand your study's research design involves a sample of middle school regular education and program for exceptional children mathematics teachers at my school site and that the confidentiality of students, teachers, other APS staff members, the schools, and the school system will be ensured.

Mrs. Johnson I would like for this letter to serve as official notification that as the principal of Sylvan Middle School, I grant you approval to begin your research studies at our school.

Sincerely,

Gwen D. Atkinson

Mrs. Gwen Atkinson
Principal of Sylvan Middle School

Appendix E (continued)

February 28, 2005

Mrs. Arica R. Johnson
SRT-1, Model Teacher Leader/Facilitator
1444 Lucille Avenue
Atlanta, Georgia 30311

Dear Mrs. Johnson:

I received a letter from Research, Planning, and Accountability about your study on the following topic *"Teachers of Mathematics Perceptions about the Impact of Supervisory Behaviors on Student Achievement."*

I understand your study's research design involves a sample of middle school regular education and program for exceptional children mathematics teachers at my school site and that the confidentiality of students, teachers, other APS staff members, the schools, and the school system will be ensured.

Mrs. Johnson I would like for this letter to serve as official notification that as the principal of Bunche Middle School, I grant you approval to begin your research studies at our school.

Sincerely,

Mr. Aaron Fernander
Principal of Bunche Middle School

REFERENCES

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